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Developing and Validating the Teacher Self-Efficacy for Teaching Students with Autism Spectrum Disorder in Inclusive Classrooms (TSE-ASDI) Scale

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DEVELOPING AND VALIDATING THE TEACHER SELF-EFFICACY FOR TEACHING STUDENTS WITH AUTISM SPECTRUM DISORDER IN INCLUSIVE CLASSROOMS (TSE-ASDI) SCALE

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ABSTRACT

DEVELOPING AND VALIDATING THE TEACHER SELF-EFFICACY FOR TEACHING STUDENTS WITH AUTISM SPECTRUM DISORDER IN INCLUSIVE CLASSROOMS (TSE-ASDI) SCALE

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This is a multi-method study to develop and validate an instrument to measure teachers' self-efficacy for teaching students with autism spectrum disorder (ASD) in inclusive early childhood classrooms, *Teacher Self-efficacy for Teaching Students with ASD Inclusive Classrooms Scale*: TSE-ASDI. I conducted literature and expert reviews as well as cognitive pre-testing with my target populations of pre-service and in-service early childhood teachers. I conducted a quantitative study using exploratory factor analysis, reliability analyses, correlational analyses, and by comparing mean differences in scores when grouped by teaching status, special education preparation and experience with individuals with ASD. My measure development process provided evidence for validity based on test content, response process, internal structure of the instrument as well as evidence based on relations to other variables. The result of this process was a highly reliable, unidimensional, 16-item scale to measure the construct of teaching students with ASD in inclusive early childhood classrooms. Based on these findings, this investigation has implications for research and practice.

Keywords: autism, teacher preparation, teacher self-efficacy, inclusion, teacher beliefs, scale development, development and validation study

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Last, I thank my family. My parents and my brother who passed on from this life during the course of my doctoral studies but who always believed in my abilities and took pride in my work. My three sisters, who cheered me on and rejoiced in my

accomplishments. My daughter, my source of strength…my son, my source of calm…and my husband, my source of stability, confidence and love.

DEDICATION

For the many teachers and interdisciplinary education professionals with whom I collaborated over the past 26 years and from whom I learned about their knowledge and fears of working with children diagnosed with autism.

For Juliet and the other parents of children with a diagnosis of autism who courageously advocate for their children's rights to an inclusive education.

For Seamus, Claude, Alex, Jimmy, and all the children with this diagnosis whom I have been blessed to know. May the sparkle in their eyes capture the hearts and minds of everyone they encounter in life as it has mine.

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CHAPTER ONE: INTRODUCTION

In the United States, the number of children diagnosed with ASD has reached sizeable proportions in recent years. In 2010, for example, the reported incidence of autism diagnoses was one out of every 68 children, a 29% increase from 2008 and a substantially larger 123% increase from 2002 (CDC, 2014). These numbers remained consistent in the most recent studies conducted in 2012 (Christensen et al., 2016). As the numbers of children diagnosed with ASD increases, so do the numbers of children eligible for special education services in schools under the classification of Autistic. During the 2000-2001 Academic Year, 0.2 percent of all children and youth ages of 3 to 21 enrolled in public school were classified as autistic; just 13 years later, this student population accounted for 1.1 percent of total enrollment (U.S. Department of Education, National Center for Education Statistics, [USDOE, NCES], 2016).

The Education of All Handicapped Children Act of 1975 made equity in education for children with disabilities a federal mandate and laid out the basic principles that still support the development of increasingly inclusive educational opportunities for all students. Subsequent reauthorizations of this legislation—first in 1990 as the Individuals with Disabilities Education Act (IDEA) and then renamed in 2004 as the Individuals with Disabilities Education Improvement Act (IDEIA), attempted to refine and enhance educational protections and opportunities for students classified as having a disability. While this legislation includes six principles, it is the principle of least

restrictive environment (LRE) that has driven the practice of inclusive education. Research findings support both the social and academic benefits of inclusive educational environments for students with disabilities (Cole, Waldron, & Majd, 2004; Cross, Traub, Hutter-Pishgahi, & Shelton, 2004; Fisher & Meyer, 2002; Harris, Handleman, Kristoff, Bass, & Gordon, 1990; Holahan & Costenbader, 2000; Kennedy, Shukla, & Fryxell, 1997; Kurth & Mastergeorge, 2010; Phillips & Meloy, 2012; Rafferty, Piscitelli, & Boettcher, 2003; Schwartz, Sandall, Garfinkle, & Bauer, 1998). This applies to students with the diagnosis of ASD from early childhood through high school (Harris, Handleman, Kristoff, Bass, & Gordon, 1990; Kurth & Mastergeorge, 2010; Schwartz, et al., 1998).

Unfortunately, general education teachers feel ill-prepared to teach students diagnosed with ASD in inclusive classrooms at all grade levels (Barned, Knapp, Neuharth-Pritchett, 2011; Busby, Ingram, Bowron, Oliver, & Lyons, 2012; Cook, 2001; Doody & Connor, 2012; Humphrey & Symes, 2013; Lindsay, Proulx, Scott, & Thomson, 2013; Teffs & Whitbred, 2009). General education teachers—both pre-service (Barned et al., 2011; Busby et al., 2012; Doody & Connor, 2012) and in-service (Cook, 2001; Humphrey & Symes, 2013; Lindsay et al.2013; Stoiber, Gettinger, & Goetz, 1998; Teffs & Whitbred, 2009) believe they lack adequate understanding of students with ASD and how to teach them. Lindsay et al. (2013) captured the fundamental fear of not knowing how to teach students with ASD expressed by the 13 educators in their study. One teacher was quoted as saying: “There’s lots of kids who enter the classroom and the teachers don’t know what to do. So these kids are underserviced. If we don’t really understand the core problems with the kids, you can’t really teach them” (p. 356).

Such reported lack of confidence in how to teach students diagnosed with ASD is a serious barrier to educating these students in inclusive classrooms. That is, to successfully support the social and academic growth of students with ASD in inclusive educational placements, general education teachers need high levels of self-efficacy (Guskey & Passaro, 1994; Soodak & Podell, 1993; Soodak & Podell, 1994; Soodak, Podell & Lehman, 1998). Research evidence demonstrates that teachers with strong self-efficacy are more open to new ideas and more willing to try new teaching strategies to meet individual student needs (Ghaith & Yaghi, 1997; Guskey, 1988; Ross, 1998; Stein & Wang, 1988).

The construct of self-efficacy emerged from Bandura's (1977, 1986, 1997) social cognitive theory. He suggested that individuals will pursue activities and situations in which they feel competent and avoid situations in which they doubt their capacity to perform successfully. According to Bandura (1986), self-efficacy beliefs are context specific judgments of one's capability to perform specific tasks in order to achieve targeted outcomes. Tschannen-Moran and Woolfolk Hoy (2001) related self-efficacy to pedagogy and defined teachers' self-efficacy as a "judgment of his or her capabilities to bring about desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated" (p. 783). According to Tschannen-Moran, Woolfolk Hoy, and Hoy (1998) two simultaneous processes occur as teachers' judge their self-efficacy: assessment of personal competence and analysis of the task.

As noted above pre-service and practicing teachers lack confidence to teach children diagnosed with ASD in inclusive classrooms (Barned, et al., 2011; Busby et al.,

2012; Cook, 2001; Doody & Connor, 2012; Humphrey & Symes, 2013; Lindsay et al., 2013; Teffs & Whitbred, 2009). Moreover, the practice of recommending and supporting inclusive educational placements for these children seems to be related to teachers' sense of efficacy for working with these children in inclusive classroom settings (Guskey & Passaro, 1994; Soodak & Podell, 1993; Soodak & Podell, 1994; Soodak et al., 1998). To ascertain the veracity of this line of reasoning research is needed to uncover the nature and functioning of teachers' self-efficacy for teaching children with ASD in inclusive settings. However, the research needed to understand these complex relations requires a measure of teachers' self-efficacy situated in the domain of teaching children with ASD in the context of inclusive classrooms addressing the tasks deemed necessary by teachers. Currently, such an instrument does not exist.

Purpose of the Study

The purpose of this three phase multi-method study was to develop and validate a teacher self-efficacy instrument to measure teachers' self-efficacy for teaching students diagnosed with ASD in inclusive early childhood classrooms, the *Teacher Self-efficacy for Teaching Students with ASD in Inclusive Classrooms Scale*: TSE-ASDI, for use with both pre-service and in-service teachers. Guided by Gehlbach and Brinkworth's (2011) recommendations for measure construction and the most recent *Standards for Educational and Psychological Testing* (American Educational Research Association, American Psychological Association, National Council on Measurement in Education [AERA, APA, NCME], 2014) I gathered evidence based on test content, response

process, internal structure, and relations to other variables to establish a validity argument for this measure.

I chose the context of inclusive early childhood classrooms for my study for two reasons. First, if a student is not included but rather segregated from general education classrooms when he or she enters school the child typically stays in that placement for their academic career (Hanson et al., 2001; Miller, Strain, McKinley, Heckathorn, & Miller, 1993). Teachers at the early childhood level of schooling are the first to begin recommendations for students' special education placements, and such recommendations have been related to teachers' sense of efficacy (Guskey & Passaro, 1994; Soodak & Podell, 1993; Soodak & Podell, 1994; Soodak et al., 1998). Thus, this is an important population of teachers to target. Second, my own experience and expertise is in the area of early childhood education allowed me to draw on my knowledge and skills in this area to better communicate with participants throughout recruitment and data collection. My experience also provided a strong resource for contextualizing the findings that emerged from this investigation. Because differences have been reported in self-efficacy between elementary and secondary educators (Fives & Buehl, 2010), I chose I chose to gather evidence to evaluate the TSE-ASDI Scale in the context of early childhood classrooms to limit variations in findings based on grade level.

Significance of the Study

Prior to this study, an instrument to measure the construct of teacher self-efficacy to teach students with ASD in inclusive classrooms did not exist. While six studies on teacher self-efficacy for teaching students with a diagnosis of ASD were conducted at the

time of this writing (i.e., Humphrey & Symes, 2013; Jennett, Harris & Mesibov, 2003; McGregor & Campbell, 2001; Ruble, Totland, Birdwhistell, McGrew & Usher, 2013; Ruble, Usher & McGrew, 2011; Teffs & Whitbread, 2009) none of the measures used in these studies examined self-efficacy for teaching in the context of inclusive general education classrooms with a focus on the tasks teachers believe to be important for working with children with ASD. My study involved the development and validation of such a measure. In so doing, my study contributed to the field of teacher preparation and teacher development by providing a tool for researchers to use in broadening our understanding of the construct of self-efficacy and the role these beliefs may play in teachers' experiences in working with children with ASD.

Research Questions

Informed by a detailed review of the literature (reported in Chapter 2), I developed Version 1 of the TSE-ASDI Scale, gathered feedback from expert reviewers, and used the feedback obtained to craft Version 2 of the TSE-ASDI Scale. To refine the scale I carried out two empirical investigations, the first of which was a qualitative inquiry involving cognitive pre-testing with a sample of target participants (Study 1). The purpose of Study 1 was to gather additional content-oriented evidence as well as response process evidence for the validity of the TSE-ASDI Scale by determining if the target populations of pre-service and in-service early childhood teachers interpreted the directions and items as intended. The following two questions guided this inquiry:

Study 1 RQ1. How do respondents interpret the directions?

Study 1 RQ2. How do respondents interpret each item?

The second study was a quantitative examination of 289 pre-service and in-service teachers' responses to the TSE-ASDI to gather additional validity evidence. I examined the factor structure of the TSE-ASDI Scale based on the entire data set as well as the factor structure for pre-service and in-service teachers separately. I examined the internal consistency of each factor and explored the relationship of this new scale to another scale that was designed to measure teachers' self-efficacy for instruction, student engagement, and classroom management. Finally, to provide additional evidence of relation to other variables I examined mean differences in participants' scores on the TSE-ASDI when grouped by experience level (pre-service/in-service), educational experience (special education preparation or none), and personal experience with individuals with ASD (experienced/not). The five questions listed below guided my inquiry in Study 2:

Study 2 RQ1. What is the emergent factor structure of the TSE-ASDI Scale?

Study 2 RQ2. How does the factor structure of the TSE-ASDI Scale differ for pre-service and in-service early childhood teachers?

Study 2 RQ3. Do the data reflected in the emergent factors for the whole sample and the pre-service and in-service samples demonstrate acceptable reliability scores?

Study 2 RQ4. Are scores on the TSE-ASDI sub-scales positively correlated with an existing measure of teacher self-efficacy (e.g., TSES, Tschannen-Moran & Woolfolk Hoy, 2001)?

Study 2 RQ5. Are previous findings in the teacher efficacy literature, with respect to teaching status (pre-service vs. in-service), special education certification, and experience with individuals with a diagnosis of ASD, replicated when teacher efficacy is assessed by the TSE-ASDI Scale?

Summary

As discussed above, the number of children diagnosed with ASD in the U.S. has reached sizeable proportions in recent years and as these numbers increase so do the numbers of children eligible for special education services in schools under the classification of Autistic. Research findings support both the social and academic benefits of inclusive educational environments for students with the diagnosis of ASD, however, general education teachers find students with ASD challenging to teach and feel unprepared to teach these students. The practice of recommending and supporting inclusive educational placements for those students deemed challenging is related to teachers' beliefs in their ability or self-efficacy to teach these students in general education settings.

Thus, it is important to understand and support teachers' self-efficacy to teach students with ASD in general education classrooms. Bandura (1986) framed self-efficacy as a context, domain, and task specific construct, and therefore it should be measured in this manner. To date, no scale has been developed to do so. The goal of this multi-method

study was to refine and validate the TSE-ASDI Scale that I developed with the input of experts in the fields of autism, inclusion and teacher self-efficacy. To achieve this goal I gathered validity evidence for the use of this scale with both pre-service and in-service early childhood teachers by further examining the test content as well as the response process, internal structure and relations to other variables.

Definition of Terms

Autism spectrum disorder. Autism spectrum disorder (ASD) is the current diagnostic label used by the American Psychiatric Association (APA) to identify the growing number of children with social communication and interaction challenges, as well as restricted, repetitive patterns of behavior, interests or activities (APA, 2013).

Early childhood educators. Teachers certified to teach children in pre-school through third grade. During these initial years of school, children typically stay in one classroom for the majority of the instructional part of the school day and therefore their education is the primary responsibility of one teacher or team of co-teachers for the entire school year. Early childhood educators play a role in a student's educational placement by screening and evaluating young children for developmental delays as well as building partnerships with families that support their on-going advocacy for their children.

Inclusive classrooms. The Individuals with Disabilities Education Act (IDEA, 1990) and its reauthorizations in 1997 and 2004, as well as the No Child Left Behind Act (NCLB, 2003) and the Every Student Succeeds Act (ESSA, 2015) require that students with identified needs be given access to the general education curriculum in the least restrictive environment. This means, students between the ages of 3 and 21 who meet

eligibility criteria in one of 13 qualifying federally defined categories of disability, including Autistic, are to be educated in general education or mainstream classrooms with nondisabled peers with the use of supplementary aides and services to the maximum extent possible. This practice is referred to as inclusion and classrooms where this practice is taking place are often referred to as inclusive classrooms.

Self-efficacy beliefs. The construct of self-efficacy is drawn from Bandura's (1977, 1986, 1997) social cognitive theory, which suggests that individuals will pursue activities and situations in which they feel competent and avoid situations in which they doubt their capacity to perform successfully. According to Bandura (1986), efficacy beliefs are context specific judgments of one's capability to perform specific tasks.

Teacher self-efficacy. Tschannen-Moran and Woolfolk Hoy (2001) related self-efficacy to pedagogy and defined teachers' self-efficacy as a "judgment of his or her capabilities to bring about desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated" (pg. 783). According to Tschannen-Moran, Woolfolk Hoy, and Hoy (1998) two simultaneous processes occur as teachers' judge their self-efficacy: assessment of personal competence and analysis of the task.

CHAPTER TWO: REVIEW OF RELEVANT LITERATURE

The purpose of this chapter is to articulate the theoretical grounding for the development of a measure of teachers' self-efficacy for teaching students diagnosed with autism spectrum disorder in general education classrooms. The chapter is organized into six sections. In the first, I examine the theory of self-efficacy and the influence efficacy beliefs have on an individual's thoughts, emotions and behaviors. In section two I discuss the construct of self-efficacy and the role it plays in teacher practice and student achievement. This discussion includes a review of the tools that have been used in educational research to measure teacher self-efficacy. I then explore the powerful role self-efficacy plays for teachers working with students who are difficult to teach and consider how this idea plays out in the context of teaching students with ASD. In the fourth section I review the empirical research on teachers' self-efficacy for teaching students with ASD and identify the tasks teachers who teach such students perceive as necessary to teach them successfully. I also examine the diagnosis of ASD and the interdisciplinary research literature on ASD to determine the extent to which these sources provide support for the tasks that teachers have reported in previous research as necessary to teach students with ASD in general education classrooms. In section five I offer an in-depth discussion of the scales used to date to measure teacher self-efficacy for teaching students with ASD. I conclude the chapter with a statement of the purpose for my dissertation study.

Self-efficacy

The construct of self-efficacy plays a central role in Bandura's (1977, 1986, 1997) social cognitive theory, which suggests that individuals pursue activities and situations in which they feel competent and avoid situations in which they doubt their capacity to perform successfully. According to Bandura (1986), efficacy beliefs are context specific judgments of one's capability to perform specific tasks. As Bandura (1997) explained, self-efficacy is an ability construct that refers "to beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). From this perspective, self-efficacy beliefs exert considerable influence on individuals' thought patterns and emotions, which in turn enable actions required for individuals to pursue goals, persist through adversity, bounce back after temporary setbacks, and exercise control over their emotions (stress or depression) as they experience demanding situations (Bandura, 1997). Those with a strong sense of self-efficacy to carry out a difficult task approach that task as a challenge to be mastered. They set goals for themselves and view setbacks as obstacles they can overcome with increased effort, knowledge and skill. In contrast, those with a low sense of self-efficacy avoid difficult tasks and dwell on their personal deficiencies. Self-efficacy is a person's belief in his or her competence not his or her actual level of competence.

Bandura (1994, 1997) contended that four main sources of information influence people's beliefs about their efficacy: 1) mastery experiences; 2) vicarious experiences; 3) social persuasions; and 4) psychological and affective states. According to Bandura, positive mastery experiences—those past experiences interpreted by the individual as

positive—are the easiest way for a person can achieve a strong sense of self-efficacy. For example, successfully hiking to the peak of a steep mountain trail would increase my self-efficacy to tackle other similar feats. Vicarious experiences are those gained by watching others carry out a task. This modeling is most powerful when we see ourselves as similar to the person carrying out the task. Therefore, watching someone my own age and physical size hike a steep trail would increase my self-efficacy to accomplish that task. Social persuasions entail persuasive messages individuals receive from others. My daughter's encouragement at the start of a climb increases my belief in my ability to reach our destination. Finally, psychological and affective states are the individual's somatic and emotional responses (i.e., stress, anxiety) regarding his or her performance. A sense of accomplishment and exhilaration rather than nausea and fatigue at the end of my mountain ascent would contribute to my self-efficacy for the task.

Bandura's social cognitive theory stands in clear contrast to behavioral theories that assume human functioning is caused by external stimuli in the environment. It is also disparate from theories of human functioning that view biological factors as pre-determinants of behavior. At the core of social cognitive theory is the view of human agency in which individuals possess beliefs about themselves that enable them to exercise control over their thoughts, feelings and actions (Pajares, 2002). How people interpret their behavior informs and changes their environment and self-beliefs, which in turn informs and changes their behavior. This concept of triadic reciprocal determinism offered by Bandura (1986) emphasizes interactions between a) personal factors such as cognition, affect and biological events; b) behavior; and c) environmental influences.

Because self-efficacy beliefs are sensitive to these factors they are task and situation specific (Pajares, 1996).

Teacher Self-Efficacy Beliefs: The Construct, Measurement and Importance

How does self-efficacy pertain to teachers? In general, teachers' self-efficacy is the belief held by teachers regarding their capability to bring about desired outcomes for their students (Bandura, 1986; Tschannen-Moran, Woolfolk Hoy & Hoy, 1998). The forty-year history of research using this construct provides convincing evidence that teachers' self-efficacy matters to both teacher practice and student outcomes. In this section I first describe the measurement of how teachers' self-efficacy and then provide an overview of research that speaks to the importance of this construct.

The Construct and Measurement

Two major lines of thinking are evident in the literature on teachers' self-efficacy (Fives & Buehl, 2016; Henson, 2002; Klassaen, Tze, Betts, & Gordon, 2011; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998; Tschannen-Moran & Woolfolk Hoy, 2001). The first is grounded in Rotter's (1966) social learning theory of internal and external locus of control. The construct of teacher efficacy was first used by Armor and colleagues (1976) in a study they conducted under the auspices of the RAND Corporation. Broadly, this study focused on school and classroom procedures considered effective in raising reading scores of urban, minority children in the Los Angeles Unified School District's School Preferred Reading Program. The survey used to gather data for this study included two items that were informed by Rotter's locus of control theory. The intent of these items was to assess whether teachers believed that student learning and motivation were under

the teacher's control. At the time the construct was referred to as teacher efficacy. This approach to measuring teacher efficacy guided research in the field in the late 1970's and early 1980's, a period during which several teacher efficacy instruments were developed, including the Teacher Locus of Control (Rose & Medway, 1981), the Responsibility for Student Achievement (Guskey, 1981), and the Webb Efficacy Scale (Ashton, Olejnik, Crocker, & McAuliffe, 1982).

In 1984, Gibson and Dembo extended the measurement of teacher efficacy by integrating central ideas from Bandura's theory of self-efficacy. Building on the assumption that the two items in the survey used by Armor et al. (1976) reflected Bandura's constructs of self-efficacy and outcome expectancy, Gibson and Dembo developed a 30-item measure, the Teacher Efficacy Scale, that consisted of two factors: personal teaching efficacy—or a teacher's belief in her ability to bring about change—and general teaching efficacy—or a teacher's belief that students can be taught despite external factors (Gibson & Dembo, 1984). This measure used a 6-point Likert scale from "strongly disagree" to "strongly agree."

Approximately a decade later, Guskey and Passaro (1994) expressed concerns with the external orientation of the general teacher efficacy factor in the Teacher Efficacy Scale, which they did not consider to be a measure of a teacher's confidence or beliefs about capabilities to carry out a task but rather a measure of external constraints that influenced student outcomes (Fives & Buehl, 2016; Henson, 2002; Tschannen-Moran et al., 1998). Other researchers were also critical about the lack of contextual specificity of the Teacher Efficacy Scale. In line with this thinking, Riggs and Enochs (1990) modified

the instrument to create the Science Teaching Efficacy Belief Instrument for use in studies of science teaching, and Coladarci and Brenton (1997) created the Teacher Efficacy Scale for Special Educators to study special education teachers teaching students with special needs in segregated classrooms.

Based on Bandura's assertion that self-efficacy influences a person's persistence and motivation for specific tasks (1986), other researchers have argued that teacher self-efficacy is best measured with regard to specific behaviors (Pajares, 1996) and about competence in a given situation (Tschannen-Moran et al., 1998; Tschannen-Moran & Woolfolk Hoy, 2001). Concern over the optimal level of specificity in the measurement of teacher self-efficacy has driven researchers to develop different types of instruments over the years. For example Ashton, Buhr, and Crocker (1984) developed a series of hypothetical teaching vignettes that asked teachers to judge themselves relative to the specific teaching task in the vignettes on a scale from "extremely ineffective" to "extremely effective." Teachers were also asked to rate their effectiveness relative to other teachers. To address the concern that teachers' sense of efficacy may not be uniform across a variety of tasks, Bandura constructed his own Teacher Self-Efficacy Scale (1997) including 30 items across seven subscales: efficacy to influence decision making; efficacy to influence school resources; instructional efficacy; disciplinary efficacy; efficacy to enlist parental involvement; efficacy to enlist community involvement; and efficacy to create a positive school climate. The items were posed with the question stem, "How much can you…" and responses were made on a 9-point scale ranging from "nothing" to "a great deal." Although this measure addressed many of the

issues of specificity posed by Bandura's theory of self-efficacy, it was later criticized for lacking alignment between the items in the seven subscales and the typical tasks encountered by teachers in the classroom (Tschannen-Moran et al., 2001).

After a review of the conceptual and empirical literature on teacher efficacy published between 1974 and 1997, Tschannen-Moran, Woolfolk Hoy and Hoy (1998) proposed an integrated model of teachers' self-efficacy that wove together both conceptual strands discussed above. In this model the sources of self-efficacy information are those described by Bandura (1986, 1997)—mastery experiences, vicarious experiences involving observing others, verbal persuasion, and physiological and affective states. These influences are subject to a cognitive process in which they are analyzed and interpreted relative to the teaching context and the specific task. Forms of the two dimensions of general teaching efficacy and personal teaching efficacy identified by Gibson and Dembo (1984) are present in this model. Analyzing specific elements of a teaching task highlights aspects that may hinder or constrain teaching similar to the general teaching efficacy scale; however, in this model the analysis also involves looking at resources or aspects of the task that may contribute to a successful outcome. Assessing one's personal teaching competence resembles the personal teaching efficacy scale in that it involves weighing one's personal teaching strengths against weaknesses in the particular teaching context. Yet, it differs in that it deals with perceptions of current ability rather than predictions of future ability. According to Tschannen-Moran and colleagues (1998) the two processes of task analysis and assessment of competence occur simultaneously and result in teachers' self-efficacy for the given context.

This model was the foundation for a new measure of teacher efficacy, the Ohio State Teacher Efficacy Scale (Tschannen-Moran & Woolfolk Hoy, 2001). It is based on Bandura's Teachers Self-efficacy Scale (1997) but with a revised list of items that were considered more representative of frequent activities in a teachers' work life. The measure, which includes three dimensions—self-efficacy for instructional strategies, self-efficacy for student engagement, and self-efficacy for classroom management—was studied with both pre-service and in-service educators.

Thirteen years after Tschannen-Moran and colleagues (1998) published their comprehensive review of the research on teacher efficacy, Klassen, Tze, Betts, and Gordon (2011) reviewed the 218 empirical articles published since 1998 on the topic. They found that many of those studies assessed teachers' beliefs in their ability to perform specific tasks rather than their ability beliefs about their functioning in general. For example, the Teacher Interpersonal Self-Efficacy Scale (Brouwers & Tomic, 2001) was designed to examine teacher self-efficacy beliefs within their interpersonal domain of functioning, with items reflecting three types of interpersonal activities of teachers—managing student behavior in the classroom, eliciting collegial support, and eliciting principles' support.

The Importance of Teachers' Self-efficacy

Teacher self-efficacy is considered one of the key motivation beliefs influencing both teachers' professional behaviors and student learning (Fives & Buehl, 2016; Henson, 2002; Klassen et. al, 2011; Tschannen-Moran & Woolfolk Hoy, 2001). Specifically, a teacher's sense of efficacy has been related to teacher persistence (e.g.,

Tschannen-Moran & Johnson, 2011), adoption of innovations (e.g., Fuchs, Fuchs, & Bishop, 1992), professional commitment (e.g., Coladarci, 1992), and stress and burnout (e.g., Jennett et al., 2003). Teachers' self-efficacy also relates to student achievement (Armor et al., 1976; Ashton & Webb, 1986; Caprara, Barbaranelli, Steca, & Malone, 2006; Mojavezi & Tamiz, 2012; Ross, 1992) and student motivation (Midgley, Feldlaufer, & Eccles, 1989; Mojavezi & Tamiz, 2012). The findings of the importance of teacher self-efficacy on student outcomes remain positive with the use of more current measures (e.g., Bolshakova, Johnson, & Czerniak, 2011; Mojavezi & Tamiz, 2012; Varghese, Garwood, Bratsch-Hines, & Vernon-Feagans, 2016). For example, Mojavezi and Tamiz (2012) investigated the influence of the self-efficacy of 80 senior high school teachers on the motivation and achievement of their students in Iran. Using a translated version of the Ohio State teacher efficacy scale (OSTES; Tschannen-Moran & Woolfolk Hoy, 2001), Mojavezi and Tamiz found a significant positive correlation between teacher self-efficacy and students' intrinsic motivation, as measured by an adapted version of Schmidt's motivation questionnaire (1996). They also reported a significant positive correlation between teacher self-efficacy and student achievement, measured by student's academic test scores.

Teacher Self-efficacy Role for Working with Students Who Are Difficult to Teach

Tschannen-Moran and Woolfolk Hoy (2001) defined teachers' self-efficacy as a "judgment of his or her capabilities to bring about desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated" (p. 783). This connection of the construct of teacher self-efficacy to

students who teachers' find challenging is relevant to my current investigation since educational research reveals that students with disabilities, and specifically students with a diagnosis of ASD, are often viewed by teachers as the most difficult students to teach (Cook, 2001; Sansosti & Sansosti, 2012; Stoiber et al., 1998; Syriopoulou-Delli, Cassimos, Tripsianis & Polychronopoulou, 2012).

Students with ASD Viewed as the Most Difficult to Teach

Syriopoulou-Delli, et al. (2012) conducted a quantitative study in Greece with 168 teachers working with students with ASD in mainstream schools (n=144), inclusive classrooms (n=8), technical schools (n=8), special education vocational centers (n=5) and multicultural schools in-service general and special education teachers (n=3). Teachers' opinions regarding the behavioral management of children with ASD were evaluated using a 33 item structured questionnaire. Teachers reported that students with ASD comprised the most difficult group of students to manage. Cook (2001), Sansosti and Sansosti (2012), and Stoiber et al. (1998) found that teachers' believed that students with ASD required the most significant accommodations and were substantially more difficult to include in general education classes than students with other disabilities. Sansosti and Sansosti (2012) conducted a qualitative study involving focus groups and individual interviews with three general and eight special education U.S. elementary teachers. Findings revealed participating teachers felt that even students considered to have high functioning ASD needed unique supports (e.g., "sensory diets," visual schedules, behavioral contracts, social skills instruction) when included in the general education classroom. Study participants also believed that students with ASD were more likely to

stand out in the general education setting due to their social, communicative and/or behavioral difficulties. Along the same lines, the general (n=35) and special education (n=39) U.S. early childhood teachers surveyed by Stoiber et al. (1998) believed that students with ASD needed the greatest accommodations in inclusive classrooms.

Teachers' Self-Efficacy and Difficult To Teach Students

Evidence suggests that teachers' support for placing students with special needs—a population typically seen as "difficult to teach"—in general education classrooms is related to teachers' beliefs in their ability to teach these students, or their self-efficacy (Gao & Mager, 2011; Soodak & Podell, 1993; Soodak & Podell, 1994; Soodak, Podell & Lehman, 1998). This theme is illustrated in a study by Soodak and Podell (1993) in which the researchers administered the Gibson and Dembo (1984) Teacher Efficacy Scale (TES) to a sample of teachers, including 96 regular educators to investigate the influence of teacher efficacy on teachers' student placement and referral decisions. They found that regular educators with higher personal efficacy, as measured by the TES, were more likely to agree with a regular education placement for students with learning and/or behavioral problems than those with lower personal efficacy. Along related lines, Soodak et al. (1998) surveyed 188 general education teachers regarding their feelings about inclusion and their beliefs about their own effectiveness as teachers (personal efficacy) using an adapted version of the TES and found that teachers who had a greater sense of personal efficacy were less anxious about including students with disabilities in their classrooms. Gao and Mager (2011) also used the TES in their study of 168 pre-service teachers enrolled in a four-year dual-certification inclusive teacher preparation program

in the United States to examine teacher candidates' sense of efficacy and attitudes toward school diversity and the inclusion of students with various special needs. They found that teacher candidates who expressed more confidence about their own teaching ability (personal teacher efficacy) had more positive attitudes toward children with academic or social disabilities and were more willing to include these children in general education classrooms.

According to Buysse, Wesley, and Keyes (1998), the negative attitudes expressed by many general education teachers about the inclusion of students with special needs has much to do with their lack of confidence in successfully teaching these students. Attitudes of both pre-service and in-service general education teachers about the inclusion of students with ASD are also related to teachers' level of confidence to teach these students (Barned et al., 2011; Busby et al., 2012; Cook, 2001; Doody & Connor, 2012; Humphrey & Symes, 2013; Lindsay et al. 2013; Stoiber et al., 1998; Teffs & Whitbred, 2009). For example, Barned et al. (2011) found that the pre-service early childhood general education teachers in their U.S. based study held serious reservations about their ability to teach children with ASD and thought that special educators, who they believed to be better prepared for the task, would perform better in that role. Along similar lines, Busby et al. (2012) concluded that pre-service (n= 9) and in-service (n= 23) general education teachers believed that "teaching children with autism is a highly individualized and specialized process that requires highly specialized skills and personal attributes" (p. 31). While study participants did not articulate the specifics of this "highly individualized and specialized process," they did explain that a successful teacher needed

to have a flexible attitude and a willingness to adapt curriculum and modify activities. They also believed that these qualities were more likely to be specific to special education teachers.

Tasks for Teaching Students with ASD in General Education Classrooms

If, as discussed above, teachers' self-efficacy beliefs are judgments or assessments of personal competence to perform specific tasks in a particular teaching context (Bandura, 1986; Tschannen-Moran, Woolfolk Hoy & Hoy, 1998), then an initial step toward developing a measure of general education teachers' self-efficacy for teaching student with ASD—as I did in this investigation—is to identify the salient tasks involved in teaching this student population in inclusive classrooms. To shed light on those tasks, I now turn to the research on teachers' beliefs about teaching students with ASD in inclusive settings as well as interdisciplinary research on ASD. Additionally, I discuss how those tasks align with high quality early childhood practice.

Teachers' Beliefs about Teaching Students with ASD in General Education Classrooms

I reviewed the U.S. and international literature on teachers' beliefs about teaching students with a diagnosis of ASD in general education classrooms, including studies conducted with pre-service and in-service general and special education teachers. From that review, I identified five tasks that general education teachers considered essential for teaching this student population: a) developing an understanding of students' needs through formal and informal assessments b) supporting social communication, c)

managing challenging behaviors, d) adapting curriculum and instruction and e) communicating and collaborating with interdisciplinary staff members and parents.

Develop an understanding of students' needs. The first task, developing an understanding of students' needs through formal and informal assessments, allows teachers to understand both the individual needs and strengths of each student with a diagnosis of ASD. Because the diagnosis of ASD covers a very large spectrum, the symptoms of individuals with this diagnosis vary widely in terms of severity and adaptive functioning (Fountain, Winter, & Bearman, 2012; Lord et al., 2006; Szatmari et al., 2015; Waterhouse, 2012). Thus, the diagnostic label cannot possibly provide sufficient information to a teacher about any individual child. General and special education teachers, both pre-service and in-service, believe that understanding the needs of each student with ASD is essential to successfully teach these students (Able et al., 2015; Barned et al. 2011; Doody & Connor, 2012; Lindsay et al. 2013; Teffs & Whitbred, 2009). For example, Lindsay et al. (2013) interviewed 13 general and special education teachers in Canada regarding their beliefs about including students with ASD in general education classrooms. Study participants repeatedly stressed the importance of knowing the needs of students with ASD to develop rapport with them and productively address situations in which students were upset or emotionally removed. One participant defined this task most clearly by stating, "If we don't really understand the core problems with the kids, you can't really teach them" (p. 356). Taking a different tack, Teffs and Whitbred (2009) used a web-based survey to investigate teachers' beliefs about teaching students with ASD in general education classrooms. Participants were general education

teachers (n=96) teaching kindergarten through high school in the United States. These teachers reported that they needed to understand the social, behavior, and communication skills of student with ASD to appropriately meet their needs. This theme also surfaced in a study by Able et al. (2015) in which they conducted focus groups with 34 general and special education in-service elementary, middle and high school teachers in the United States with experience teaching students with ASD in general education classrooms. These researchers found that the study participants believed they needed to understand the individual characteristics of students with ASD to support their inclusion. Abel et al. (2015) further noted that during the focus groups, "[t]eachers discussed how they were baffled by the range of ASD characteristics and were unclear about how to address individual students' personalities and needs" (p. 50).

In the studies reviewed, teacher candidates also indicated that assessing the strengths and challenges of students with ASD was a necessary task to support their inclusion in general education classrooms. For instance, in a case study of a pre-service general education teacher engaged in a practicum experience in Ireland, Doody and Connor (2012) reported that the candidate identified the need for knowledge of students with disabilities, including students with ASD, to feel confidence that she could teach these students. Similarly, Barned et al. (2011) who surveyed 15 pre-service early childhood general education teachers in the United States about the inclusion of young children diagnosed with ASD and then conducted interviews with four of them also found that study participants believed general education teachers needed a deep understanding of students with ASD to teach them in inclusive classrooms. In brief, the

research shows that both in-service and pre-service general teachers believe they need to understand the core challenges of students with ASD in the areas of social skills, communication, and behavior to teach them in mainstream classrooms.

Support social communication. The second key task that emerged from my review of the literature is supporting the social communication of students with ASD in the general education classroom (Finke, McNaughton, & Drager, 2009; Humphrey & Symes, 2013; Lindsay et al., 2014; Soto-Chodiman, 2012; Teffs & Whitbred, 2009). For example, Finke et al. (2009) reported that five U.S. general education teachers of elementary age students believed that children with ASD are challenged in inclusive educational settings because of the need for increased communication with their peers and social skills to interact with them. Similarly, the five primary level general education teachers in an Australian-based study by Soto-Chodiman (2012) discussed the need to support the social communication between students with ASD and their peers. Participants in this study also noted the need to support students with ASD in their pragmatic understanding of language as well as social communication between themselves and their counterparts. One teacher shared;

"Well the main challenge was that I just couldn't communicate with him. I just wanted to talk to him. I wanted to make him understand things … but whenever I wanted to talk to him he just avoided me…he used to just turn around, give me his back, and avoid contact…I just wasn't sure he was learning or not" (p.6).

Along related lines, Lindsay et al. (2014) showed that elementary teachers (n= 13) working in inclusive classrooms in Canada who participated in in-depth interviews

discussed the importance of building warm, responsive relationships with children with ASD to help them feel safe and comfortable in general education classrooms. These teachers also stressed the importance of helping children with ASD communicate with peers and develop friendships.

In a study conducted in England by Humphrey and Symes (2013), secondary general education subject area teachers (n= 32) and special education administrators (n= 21) perceived communication to be a primary challenge for students with ASD in inclusive educational settings. Participants in this study believed challenges with communication negatively influenced the social interactions of students with ASD and their peers. Finally, in a U.S. based study, Teffs and Whitbred (2009), surveyed elementary, middle, and high school general education teachers (n= 96) about their feelings of preparedness to teach students with ASD in general education classrooms. Respondents overwhelmingly believed that they needed more training in the area of communication to appropriately support the needs of these students. In summary, the extant research consistently shows that general education teachers from elementary through high school grades believe that supporting students with ASD to communicate with their teachers and peers is essential to their successful integration into general education classrooms.

Manage challenging behaviors. A third task identified by general education teachers as important to teaching students with ASD was that of managing challenging student behavior (Humphrey & Symes, 2013; Lindsay et al., 2014; Soto-Chodiman et al., 2012, Teffs & Whitbred, 2009). For instance, Humphrey and Symes (2013) found that

secondary general education subject area teachers and special education administrators in England perceived inappropriate emotional behavior to be a significant challenge for students with ASD in inclusive educational settings. In a similar vein, Soto-Chodiman et al. (2012) reported that primary level general education teachers in their Australia-based qualitative study indicated being challenged by the need to repeatedly manage the behavior of students with ASD associated with their rigidity, lack of awareness of personal space/boundaries, stereotypic utterances, and physical mobility. Likewise, elementary, middle, and high school general education teachers in the United States with at least one student with ASD in their classroom responding to an on-line survey administered by Teffs and Whitbred (2009) noted that managing these students' challenging behaviors was a primary aspect in teaching them. One teacher in this study commented, "My biggest challenge has been in learning how to get him to calm down or re-evaluate before he has an outburst that disrupts the entire class" (p. 16). In Canada, Lindsay et al. (2014) reported that general education elementary teachers in their study frequently discussed the importance of having plans to avoid or minimize distress or behavioral outbursts on the part of students with ASD. Simply put, the research supports the view that elementary through high school teachers in general education settings believe that managing behaviors of students with ASD, including emotional outbursts, rigidity, lack of awareness of personal space/boundaries, stereotypic utterances, and physical mobility within the classroom is critical for teaching these students.

Adapt curriculum and instruction. Adapting curriculum and instruction was identified as an essential task for teaching students with ASD by both future and

practicing general education teachers in the United States (Busby et al., 2012; Stoiber et al., 1998; Teffs & Whitbred, 2009) and abroad (Doody & Connor, 2012; Lindsay et al., 2014; Soto-Chodiman et al., 2012). In the United States, Busby et al. (2012) conducted interviews with pre-service teacher candidates and in-service teachers as part of an evaluation study of a teacher education program designed to prepare general education teachers to teach children with ASD. Participants in this study believed that teachers must be willing to adapt curriculum and modify instructional activities to successfully teach students with ASD. Similarly, the thirty-five early childhood teachers surveyed by Stoiber et al. (1998) overwhelmingly indicated that adapting the curriculum was an essential aspect of teaching students with ASD in inclusive classroom settings. In fact, they believed that students with ASD needed the greatest accommodations of all their students. Teffs and Whitbred (2009) also reported similar results based on their survey of elementary, middle and high school general education teachers.

Among the studies conducted abroad, Soto-Chodiman et al. (2012) found that the 12 primary level general education teachers in their Australia-based qualitative study considered that modifying the curriculum to accommodate the learning needs of students with ASD was a central task in teaching this student population. Similarly, the pre-service general education teacher candidate in Doody and Connor's (2012) case study, conducted in Ireland, identified adapting lessons for students with special needs essential. Along similar lines, the 13 Canadian elementary school teachers working in inclusive classrooms in a study conducted by Lindsay et al. (2014) shared in interviews that although tailoring teaching methods to students' needs and strengths was good practice

for all students, it was especially important when teaching students with ASD. In brief, as the findings reported above suggest, general education teachers in the United States and elsewhere believe that adapting curriculum and instruction is an essential teaching task to support the inclusion of students with ASD in inclusive settings.

Communicate and collaborate with interdisciplinary staff members and parents. Communicating and collaborating with interdisciplinary staff members and parents was expressed by general educators in several studies as a necessary task for teaching students with ASD in inclusive classroom settings (Barned et al. 2011; Glashan, Mackay, & Grieve, 2004; Humphrey & Symes; 2013; Lindsay et al., 2013; Lindsay et al., 2014; Stoiber et al., 1998; Teffs & Whitbred, 2009). Early childhood teachers in the United States surveyed by Stoiber et al. (1998) believed that the time and opportunities to collaborate with others was essential to include children with ASD in general education classrooms. While this study did not specify with whom teachers felt they needed to collaborate, the participants in a study by Teffs and Whitberd (2009), which included 96 elementary, middle and high school general education teachers, mentioned that it was important to work closely with paraprofessionals and special education team members. Collaboration and communication with paraprofessionals or teaching assistants to support the individual needs of students with ASD was also highlighted in the findings of some studies (Barned et al. 2011; Humphrey & Symes, 2013; Lindsay et al., 2014). Additionally, general educators expressed the importance of interdisciplinary teamwork, specifically collaboration and communication with special educators, occupational therapists and speech and language therapists (Lindsay et al., 2013; Lindsay et al., 2014;

Teffs & Whitbread, 2009). In-service general education teachers from five schools that received support from an outreach service in Scotland believed that speech and language therapists were the most effective source of support for helping them include students with ASD (Glashan et al., 2004). In Canada, elementary teachers (n= 13) working in inclusive classrooms mentioned that teamwork among interdisciplinary school staff, including resource teachers, teaching assistants, and occupational therapists was necessary to develop strategies for teaching students with ASD placed in mainstream classrooms (Lindsay et al., 2014). One teacher in this study with 22 years of experience expressed the particular importance of collaboration for supporting the inclusion of students with a diagnosis of ASD: "In all my career, there's been no other disability that has required as much of a village to raise a kid. I've just never seen a disability where you really need everybody's input" (p. 114).

Communication and collaboration with families was also identified by in-service and pre-service general and special education teachers as critical to the successful integration of students with ASD in inclusive classrooms (Busby et al. 2012; Finke, McNaughton, & Drager, 2009; Lindsay et al., 2014). For instance, Canadian general education elementary teachers in a study by Finke et al. (2009) shared that communication with parents helped teachers gain a better understanding of the individual child and his or her specific needs. In the same way, five general education elementary teachers who participated in focus groups in a United States study by Finke et al. (2009) underscored the importance of communication between school and home. As the above discussion suggests, communicating and collaborating with interdisciplinary staff

members and parents is seen by general educators as playing a central role in teaching students with ASD in inclusive classrooms.

Overall, the studies reviewed here shed light on what general education teachers feel they need to be able to do to successfully teach students with ASD in their classrooms. Thus, teacher self-efficacy for teaching students with ASD in inclusive settings should be measured by asking teachers about their judgment of their ability to carry out the five tasks described above. For purposes of this study, these will be referred to as "Autism Inclusion Tasks."

ASD Diagnosis and Interdisciplinary Research Literature

This section is organized according to the five Autism Inclusion Tasks discussed above, which emerged from my review of the empirical literature on teachers' beliefs about teaching students with ASD in general education classrooms. For each task, I examine the support found in the ASD diagnosis (APA, 2013) and from research in the fields of psychology, neurology, speech and language, and occupational and physical therapies.

Develop an Understanding of Students' Needs

The diagnosis of ASD covers a very large spectrum of individual differences. In May 2013, the American Psychiatric Association released the most recent edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) making modest alterations to the previous diagnosis of ASD based on new insights that emerged from research since 1990 when the DSM-IV was published. The goal of these manuals has been to provide a common language for describing individuals who present with a certain

set of behaviors. Unfortunately, psychologists and psychiatrists have the same diagnostic label of ASD to describe individuals with a broad range of challenges including three levels of severity (APA, 2013). This broad label of ASD accompanies students into the classroom and teachers therefore have very little information about the individual profile of the child in their class. If they are familiar with the diagnosis, they anticipate that the child has restricted, repetitive patterns of behavior, interests, or activities and has difficulty with social interaction and communication. The specifics of each child's individual strengths and challenges are not all captured by the diagnostic label. As a result, teachers need to develop their own understanding of the individual needs of each child with this diagnosis. The heterogeneity of the individual profiles of children with ASD is supported by the interdisciplinary research literature. While all children given the diagnosis of ASD have social communication challenges, their language profiles are very heterogeneous (Kjelgaard & Tager-Flusberg, 2001; Tager-Flusberg, 2006). One child may be non-verbal and another child of the same age with this diagnosis may speak in full sentences. The non-verbal child may be very proficient at using pictures or assistive technology to make his ideas and feelings known to others, while the highly verbal child may not use his language to interact with others. As a result, the teacher must approach teaching these two children differently. Similarly, research supports the heterogeneity of the sensory processing of those diagnosed with ASD. For example, in a study conducted by Tomchek and Dunn (2007), 95% of the children aged 3 to 6 diagnosed with ASD (n= 267) were also rated as having some degree of sensory processing difference from the norm (p. 194). These sensory differences, as measured by the Short Sensory Profile

(McIntosh, Miller, & Shyu, 1999) included sensation seeking, tactile, task and smell avoidance as well as auditory filtering difficulty.

The cognitive abilities of children with the diagnosis of ASD are also diverse. While individuals with ASD are often thought to have intellectual disabilities, 44% have intellectual abilities that are average or above average according to the most recently reported surveillance studies conducted in 2012 (Christensen et al., 2016). Because children may have the same diagnosis of ASD but display vastly different communication, sensory and cognitive profiles, understanding the individual needs of each student with ASD is an essential task for teaching these students in general education classrooms.

Support Social Communication

As stated above, all children given the diagnosis of ASD have social communication challenges and the presentation of their expressive communication abilities range from non-verbal to highly verbal (Kjelgaard & Tager-Flusberg, 2001; Tager-Flusberg, 2006). Receptive language challenges are also diverse and include difficulties with perception of human speech, difficulties parsing words from the speech, difficulties connecting auditory information to visual information, and difficulties attending to and comprehending spoken language (Prizant & Wetherby, 2005; Tager-Flusberg, Paul, & Lord, 2005; Williams, 2008). Understanding others, be it ones' teacher or peers, influences social relationships and learning. Expressing oneself to others does as well. Since all children with the diagnosis of ASD have some type of communication

challenges, supporting social communication is an essential task for teaching students with ASD in general education classrooms.

Manage Challenging Behaviors

By nature of the diagnosis, all children diagnosed with ASD exhibit restricted, repetitive patterns of behavior, interests, or activities. These behaviors may include repetitive motor movements, use of objects or speech, extreme distress at small changes, difficulty with transitions and rigid thinking patterns or rituals. They may also include hyper- or under-reactivity to sensory aspects of the environment (APA, 2013). According to Matson and Wilkins (2009), children diagnosed with ASD have more challenging behaviors than children without ASD, who are either typical or a-typical in their development. These researchers conducted a study of three groups of children between the ages of 2 and 17. The first group had a diagnosis of ASD (n= 182), the second group had atypical development but did not qualify for a diagnosis of ASD (n= 31), and the children in the control group were typically developing (n= 100). Two scales developed by Matson and Wilkins—the Autism Spectrum Disorders-Diagnostic for Children and the Autism Spectrum Disorders-Behavior Problems for Children—were used in this study. As might be expected based on the behavioral nature of the ASD diagnosis, the children with a diagnosis exhibited greater levels of challenging behaviors than both the non-ASD typically developing and atypically developing groups. Since all children with the diagnosis of ASD have some type of restricted or repetitive pattern of behavior and children with ASD have more challenging behavior than their typically

developing peers, managing challenging behavior is an essential task for teaching students with ASD in general education classrooms.

Adapt Curriculum and Instruction

Given the vast heterogeneity among those diagnosed with ASD, the need to adapt curriculum and instruction for this group of learners also varies greatly. As discussed above, children diagnosed with ASD may have challenges with receptive language or comprehension, including challenges understanding the spoken word, difficulty making meaning of individual words, challenges connecting an auditory stimulus to its visual representation, and difficulty attending to and comprehending spoken language (Prizant & Wetherby, 2005; Tager-Flusberg, Paul, & Lord, 2005; Williams, 2008). Children with these challenges require that curriculum content be represented to them in multiple ways (i.e., visuals, text, sign language) to support their comprehension (Williams, 2008). Children with ASD who are non-verbal require alternate ways to express themselves such as augmentative communication systems (Finke et al., 2009).

Children with ASD may also have motor challenges including gross motor and fine motor delays, as well as difficulties with planning and sequencing complex motor sequences (Bhat, Landa, & Galloway, 2011; Forti et al., 2011). According to Fuentes, Mostofsky, and Bastian (2009), one major fine motor challenge that requires adaptations in school is difficulty with handwriting. These researchers found that children who experienced fatigue or frustration when writing required other means of expressing themselves (i.e., typing, dictating). Most obvious, perhaps, is the need to adapt and modify the curriculum for children with ASD who have cognitive challenges. As

discussed above, the cognitive abilities of students with a diagnosis of ASD (based on standardized measures) range from below average to above average (Christensen et al., 2016). Given the varied and complex needs of these students, adapting curriculum and instruction is an essential task for teaching students with ASD in general education classrooms.

Communicate and Collaborate with Interdisciplinary Staff Members and Parents

The interdisciplinary research literature used above to explain the diverse communication, motor, and sensory profiles of children diagnosed with ASD makes a strong case for the need for communication and collaboration between general educators and staff members from other disciplines such as occupational therapy, physical therapy, speech and language therapy as well as special education. In school, students diagnosed with ASD who are included in general education classrooms may receive additional supports and services from these staff members. These professionals can play a large role in helping general education teachers to assess the individual needs of students with ASD and to develop strategies to support the students' engagement and learning in the general education classroom. Parents and caregivers spend the most time with their children, have a longitudinal picture of their strengths and challenges, and are considered by many to be the real experts about their individual child (Gabrielsen et al., 2015). Since interdisciplinary staff members as well as parents have valuable information about children with the diagnosis of ASD, communicating and collaborating with interdisciplinary staff members and parents is an essential task for teaching students with ASD in general education classrooms.

High Quality Early Childhood Practice

Since the purpose of my study was to develop and validate a teacher self-efficacy instrument to measure teachers' self-efficacy for teaching students diagnosed with ASD in the context of inclusive early childhood classrooms, I examine how these Autism Inclusion Tasks align with high quality early childhood practice.

Develop an Understanding of Students' Needs

Early childhood educators need to have an understanding of the individual needs of all their students in order to provide a high-quality education. This requires that these professionals have knowledge of child development and learning, the biological and environmental factors that influence development, the influence of culture on development and learning, as well as the importance of nurturing and consistent relationships. They must also have the ability to recognize signs that children may need assessments and additional services (Institute of Medicine [IOM] & National Research Council [NRC], 2015; National Association for the Education of Young Children [NAEYC], 2009).

Support Social Communication

There is a strong focus on language development in high quality early childhood programs, especially as it relates to peer interactions and emergent literacy skills (NAEYC, 2009). Early childhood educators require training and expertise in the skills needed to scaffold communication and learning between peers (IOM & NRC, 2015).

Manage Challenging Behaviors

Challenging behaviors or social-emotional developmental delays are very common among children in early childhood classrooms and a lack of program capacity to manage these challenges is a major barrier to inclusion and contributes to suspensions, expulsions and exclusions. Staff capacity building in knowledge, skills and beliefs informed by early childhood mental health consultation as well as positive behavior intervention and supports frameworks is strongly recommended for all early childhood educators and administrators (IOM & NRC, 2015).

Adapt Curriculum and Instruction

Young children begin their educational journeys with varying degrees of cognitive, social and physical abilities yet they all need to feel competent safe and secure in the classroom environment (Stockall, Dennis, & Miller, 2012). All young children benefit when early childhood educators have an "advanced understanding and capacity for individualizing learning and can provide appropriate developmental supports for each child" (IOM & NRC, 2015, p. 4).

Communicate and Collaborate With Interdisciplinary Staff Members and Parents

The presence of nurturing and consistent relationships is critical to optimal early childhood development and the most important early relationships are those that children form with their parents or other primary caregivers (NAEYC, 2009; National Scientific Council on the Developing Child [NSCDC], 2004). Therefore, it is critical that early childhood educators both learn from as well as support parents and caregivers as active partners in a child's education. Additionally, since all the domains of development; social/emotional, language, cognitive, and physical are interrelated there is a need for

knowledge across all these domains in order to fully understand the complexity of early childhood development and learning. This often requires that early childhood educators communicate and collaborate with interdisciplinary professionals (NAEYC, 2009).

Research on Teacher Self-efficacy and ASD

In the previous section I reviewed the research on teachers' beliefs about educating students diagnosed with ASD placed in general education classrooms to identify the tasks they consider essential in teaching those students in inclusive settings. I then determined that the five tasks emerging from that review are consistent with APA guidelines for diagnosing ASD and supported by the interdisciplinary research on students with ASD. I now turn to the research on teacher self-efficacy for teaching students with ASD, focusing specifically on the tools used to measure teacher self-efficacy in these studies.

In 2013, Ruble, Totland, Birdwhistell, McGrew, and Usher reviewed the empirical literature on teachers' self-efficacy and found only two studies on teachers of students' diagnosed with ASD (Jennett et al., 2013; Ruble et al., 2011). Both of these investigations were conducted in the United States and involved special education teachers, not general education teachers in the context of inclusive classrooms. Given the limited research in my area of interest, I expanded the selection parameters and included research conducted in the United States and other countries on teaching students with a diagnosis of ASD in both self-contained and inclusive educational settings. At the time of this writing, only six such studies have been published (Humphrey & Symes, 2013; Jennett et al., 2003; McGregor & Campbell, 2001; Ruble et al., 2013; Ruble et al., 2011;

Teffs & Whitbread, 2009). I reviewed these studies to determine how measures of teacher self-efficacy for teaching students with ASD were adapted or developed, whose self-efficacy they measured, and which of the five Autism Inclusion Tasks discussed above they examined, if any (see Appendix A for a summary of the six studies).

TSE Studies Focused on Self-contained Classrooms

Three of the six studies focused on the self-efficacy of special education teachers working primarily with students with ASD in self-contained classrooms (Jennett et al., 2003; Ruble et al., 2011; Ruble et al., 2013). Jennett et al. (2003) explored professional self-efficacy and burnout in special education teachers working with children with ASD in special education classrooms. They surveyed 34 teachers using Applied Behavior Analysis (ABA) in self-contained schools and 30 teachers in self-contained classrooms using the approach known as Treatment and Education of Autistic and Communication-Related Handicapped Children. The self-efficacy measure used in this study was a modified version of the Teacher Efficacy Scale for Special Educators (Coladarci & Breton, 1997), a scale developed specifically for use with special educators working in resource rooms and based on Gibson and Dembo's (1984) teacher efficacy scale. Similar to the original Gibson and Dembo scale, participants were asked to indicate their level of agreement with 30 items (each item corresponding to one of two teacher efficacy dimensions—personal efficacy or general efficacy—along a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree). Jennett and colleagues made modifications to wording in the scale to more closely align with terminology used by special education teachers working in special education classrooms specifically with students with ASD. I

sent an inquiry to the primary author for clarification on the adapted protocol but did not receive a response. While the adapted scale itself was not included in the Jennett et al. (2003) article, specific word changes were discussed. From the information provided in the article, it appears that one item for the Personal Efficacy dimension was, “When a special education student is having difficulty with a skill, I am usually able to adjust it to a student’s level” and one item for the General Efficacy dimension was, “When it comes right down to it, a special education teacher really can’t do much because most of a student’s motivation and performance depends on the home environment” (p. 587). Interestingly, within the personal efficacy domain teachers’ were asked about their judgment of their ability to carry out two of the four Autism Inclusion Tasks: adapting curriculum and instruction as well as managing challenging behaviors.

The 64 teachers in the Jennett et al. (2003) study also completed the Autism Treatment Philosophy Questionnaire the researchers had developed to determine the participants’ commitment to the two treatment approaches, and the Maslach Burnout Inventory-Educators Survey (Maslach, Jackson, & Schwab, 1996) was used to measure teacher burnout. The results of the study showed that a high commitment score for both approaches was positively correlated with a teacher’s higher sense of personal efficacy.

Ruble, Usher, and McGrew (2011) explored the relationship between the factors of mastery, social persuasion, and affective/physiological states and the self-efficacy beliefs reported by 35 special education teachers of students with ASD between the ages of 3 and 9. The researchers used the Teacher Interpersonal Self-efficacy Scale (TISES; Brouwers & Tomic, 2001), a 24 item self-report measure that taps into teachers’

perceptions of their abilities to manage classrooms, and elicit support from colleagues and principals. To examine sources of efficacy, they used a direct experience measure (background information) as a proxy for mastery, the Multifactor Leadership Questionnaire (Avolio, Bass & Jung, 1999) as a proxy for social persuasion, and the Maslach Burnout Inventory (Maslach, Jackson, & Leiter, 1997) to assess the affective and physiological states. Since there was no direct measure of vicarious experience available, Ruble and colleagues did not explore this theorized source of self-efficacy in this study but instead included it as a recommendation for future research. They found a statistically significant relationship between physiological/affective states and self-efficacy, but no relationships were found for the other two sources of self-efficacy. In their discussion of findings the authors speculated that the heterogeneity in symptom presentation of students with ASD accounted for the noted absence of a significant relationship between the teachers' mastery experiences (measured by numbers of years of teaching), and their reported self-efficacy. As they explained, although the special education teachers in the study were experienced teaching students with ASD, the heterogeneity of this spectrum diagnosis "creates challenges in generalizing information learned from teaching one child with autism to another child" (Ruble et al. 2011, p. 71).

Ruble et al. (2011) cited another limitation of this study that has relevance to the development of any new teacher self-efficacy measure. Based on the theoretical tenet that self-efficacy is a task-specific judgment, the researchers questioned the tasks in the measure they used for teacher self-efficacy, the TISES (Brouwers & Tomic, 2001), which they considered general and not sufficiently attentive to the specific skills required to

teach students with ASD. Based on my review of the literature this concern is well founded since the TISES only asked teachers about their judgment of their ability to carry out two of the five Autism Inclusion Tasks discussed above; namely, managing challenging student behaviors and communicating and collaborating with interdisciplinary staff members.

In response to these limitations, Ruble et al. (2013) developed a new measure, the Autism Self-efficacy Scale for Teachers (ASSET). The ASD specific tasks included in the ASSET were defined by the autism trainers in the local department of education and by guidelines provided by the National Research Council (2001). Ruble et al. (2013) describe the ASSET as "a 30-item self-report measure intended to assess the beliefs of special education teachers about their ability to carry out professional tasks associated with teaching students with autism" (p. 4). Forty-four special education teachers were asked to rate their self-efficacy to conduct various assessment, intervention, and classroom based practices. Based on correspondence with L.A. Ruble (personal communication, March 8, 2016, and March 11, 2016), the ASSET was intended for use with special education teachers working in both self-contained and general education classrooms. The structure of the measure was drawn from Bandura's (2006) instructions for creating self-efficacy scales and therefore uses a 100-point rating scale.

Ruble et al. (2013) asked participants to rate their self-efficacy to perform the ASD specific teaching tasks on a scale from 0 (cannot do at all) to 100 (highly certain I can do), basing their ratings by considering a particular student with ASD in their classroom. The focus on a particular student with ASD was used to address the lack of

generalizability of teaching experience cited by Ruble et al. (2011). Participants in the ASSET study were also asked to complete the Maslach Burnout Inventory (MBI; Maslach, Jackson, & Leiter, 1997) as well as Part B of the Index of Teaching Stress (Abidin, Greene, & Konold, 2004), which included several subscales (self-doubt/need for support, loss of satisfaction from teaching, disruption of the teaching process, frustration working with parents).

To demonstrate evidence of construct validity for the ASSET, the researchers hypothesized that self-efficacy scores measured with this new scale would be negatively associated with scores on the subscales of the measures of teacher burnout and teacher stress because responses to these other scales were not specific to teaching students with ASD. However, results of the study indicated ASSET scores were negatively correlated with scores on only two of the subscale measures of teacher stress (i.e., self-doubt/need for support and disruption of the teaching process) and were not significantly correlated with scores on the measure of teacher burnout. Ruble and colleagues explained that while all correlations were in the expected direction, the small sample size (n=44) may have limited the ability to detect small correlations and there may have been related concepts in the ASSET items and the teacher stress items related to self-doubt. The psychometric analysis of the dimensionality of the ASSET revealed teachers' responses to the items were internally consistent and the items reflected one dominant factor. That is, all of the items explained a similar amount of variance in the scores between participants.

In their validation study, Ruble et al.(2013) also examined the necessity of the 100-point scale since respondents did not use the full range of 0-100 ratings. Because

most respondents used 50 as the low anchor, the authors collapsed all scores between 0 and 50 into zero to establish a new base. For the scores above 50, respondents tended to use values at the endpoint of a decade (e.g., 60, 70, 80, 90, 100). Therefore, the researchers collapsed all values within each decade above 50, resulting in a 6-point scale. They reanalyzed the data based on this re-categorization and found all results to be virtually identical.

While the items in the ASSET were not based on teachers' beliefs of the tasks necessary to teach students with ASD but rather tasks identified by autism trainers and included in guidelines provided by the National Research Council (2001), it nevertheless included items representing each of the five Autism Inclusion Tasks. Each item from the ASSET can be aligned with one of these tasks, as noted in Table 2.1. Therefore, the five tasks that emerged from my literature review are consistent with tasks identified by experts in the field of autism.

Table 2.1

Alignment of ASSET Items and Autism Inclusion Tasks

Autism Inclusion Tasks	ASSET Items
Develop an understanding of the needs students with ASD through formal and informal assessment	1. Conduct an assessment of this student's developmental skills/learning skills. 2. Describe this student's characteristics that relate to autism. 13. Assess the causes of problematic behaviors of this student. 18. Assess this student's social interaction skills. 19. Assess this student's play skills

Autism Inclusion Tasks	ASSET Items
Adapt curriculum and instruction for students with ASD	3. Describe the implications for intervention based on this student's characteristics of autism. 4. Translate assessment information into teaching goals and objectives for this student. 5. Write a measureable objective for this student. 6. Write a teaching plan for this student based on goals and objectives. 7. Generate teaching activities for this student. 8. Organize the classroom to increase opportunities for learning for this student. 9. Use visual structure to increase this student's independence. 16. Collect data to monitor this student's progress toward objectives. 17. Make use of data to re-evaluate this student's goals or objectives. 28. Motivate this student. 29. Help this student feel successful. 30. Teach this student academic skills.
Manage challenging behaviors of students with ASD	14. Design positive behavioral supports for this student. 15. Implement positive behavioral supports for this student.
Support the social communication of students with ASD	10. Help this student understand others. 11. Help this student be understood by others. 12. Provide opportunities for communication in the classroom throughout the day for this student. 20. Teach this student social interaction. 21. Teach this student play skills. 22. Train peer models to improve the social skills of this student. 26. Help this student remain engaged. 27. Sustain this student's attention.
Communicate and collaborate with interdisciplinary staff members and parents	23. Describe parental concerns regarding this student. 24. Communicate and work effectively with this student's parent(s) or caregiver. 25. Describe parental priorities for learning with regard to this student.

TSE Studies Focused on General Education Classrooms

Three studies (Humphrey & Symes, 2013; McGregor & Campbell, 2001; Teffs &Whitbread, 2009) were particularly relevant to my dissertation study given their specific focus on the self-efficacy of general educators working with students with ASD in general education classrooms. McGregor and Campbell (2001) investigated the attitudes, opinions and ideas of general and special education teachers in Scotland regarding the partial or full inclusion of students with ASD into mainstream schools. The researchers developed separate questionnaires for use with the special education and general education teachers, and only the general education teachers were asked questions that pertained to what I categorized as proxies for teacher self-efficacy. General education teachers were divided into those who had taught a child with ASD and those who had not based on responses to questions about their teaching experience. Both groups were asked about their perceived skill to teach students with ASD, ("Do you feel you have the skills to teach a child with autism?"), followed a binary forced choice (e.g., yes/no) response format. I also considered this a proxy for self-efficacy based on its relationship to Bandura's definition of this term, which as he put it is "to believe in one's capabilities to organize and execute the courses of action required to produce given attainments" (1997, p. 3). Ten experienced general education teachers said they had the skills to teach students with ASD and 11 reported they did not. Meanwhile, 24 teachers without experience teaching students with ASD indicated that they lacked the skills, with another three from the inexperience group not responding to the question.

The questionnaire used in this study also addressed general education teachers' beliefs about their ability to cope with problem behaviors. While McGregor and Campbell (2001) did not use the term, self-efficacy, they did investigate teachers' beliefs in their ability to cope with challenging behaviors, one of the Autism Inclusion Tasks I identified from my review of the relevant studies. McGregor and Campbell (2001) stated that experienced general education teachers were "significantly more confident about coping with typical autism behaviors" (p. 202), which I accepted as a proxy for self-efficacy for the task of managing challenging behaviors. These teachers were asked to rate their own ability to cope with ten behaviors deemed by the authors to be common in autism (language problems, lack of motivation, high levels of anxiety, vulnerability, emotional immaturity, inappropriate emotional behavior, lack of self-control and screaming). Justification for this list of behaviors was not provided beyond stating that the final questionnaire was developed after initial piloting. It is of interest to note that one of these ten behaviors, Language Problems, regarding which teachers were asked to rate their coping ability, could be viewed as a proxy for supporting social communication, a different Autism Inclusion Tasks.

General education teachers were asked to rate their ability to cope with these behaviors using a five-point scale (1 = could cope easily and 5 = could not cope at all). Experienced general education teachers reported feeling better able to cope with all the listed behaviors than the inexperienced teachers. The items in this section were combined to create a total "coping" score from 10 and 50. The overall mean for the experienced group was 25.79 and the inexperienced group was 31.33. While a t-test showed an overall

statistically significant difference between the groups, the only significant difference when individual t-tests were run using Bonferroni's correction was for coping with emotional immaturity.

Humphrey and Symes' (2013) used an adapted version of the questionnaire included in the study by McGregor and Campbell (2001) to examine the experience, attitudes and knowledge of school staff in relation to inclusive education for pupils with ASD in mainstream secondary schools in the United Kingdom. Comparisons were made between senior managers (n= 21) including special education coordinators and general education subject area teachers (n= 32). Unlike McGregor and Campbell's (2001) study, all of the participants in this investigation were given the same questionnaire. The only noted adaption made to the questionnaire was the list of autism behaviors against which participants were asked to rate their ability to cope. This new list of behaviors was based on the recommendations of a steering group comprised of a Special Educational Needs Coordinator, an Educational Psychologist, a professor in Special Educational Needs, and a representative from the National Autistic Society. All but one of the items ('high levels of anxiety") were replaced by the following items: need for rigid routine; poor motor skills; special interests/high levels of understanding in mathematics; rigid literal thinking; lack of social understanding; lack of eye contact; poor turn-taking skills; preference for working/playing alone; and displaying inappropriate emotions. Similar to McGregor and Campbell's (2001) study, no specific tasks affiliated with the question regarding perception of skill to teach a student with ASD were included. Of the 32 general education subject area teachers, 19 felt they had the skills to teach students with ASD and

12 did not. According to the teachers, ‘displaying inappropriate emotions’ was the most difficult behavior to cope with and ‘need for rigid routine’ the easiest.

Finally, Teffs and Whitbread (2009) conducted a study with elementary (n=56), middle (n= 27) and high school (n= 37) general education teachers in the United States to explore their formal and informal preparation for teaching students with ASD and their confidence and competence for teaching them using a three-part on-line survey developed for the study and piloted on a 10-person convenience sample. Section one of the survey gathered demographic information, including teaching experience and the number of children with ASD assigned to each teacher’s class that school year. Section two was comprised of questions regarding the teachers’ experiences with students with ASD, including whether they had been given information about those students and who provided it. The questionnaire also asked if teachers’ feelings about students with ASD had changed (positive or negative) since having a student with ASD in their classroom and whether they agreed with the inclusive student placement. Items in this section also asked teachers about the greatest challenge they faced when teaching students with ASD.

The third and final section of the survey focused on the types of “training” teachers had received for teaching students with ASD, their perceptions regarding additional training needed and preparedness to teach students with ASD in general education classroom. The question about respondents’ sense of preparedness can be considered a proxy for self-efficacy given the stated purpose of the study to explore general education teachers’ feelings of confidence and competence to teach students with ASD. However, since the tasks within the construct of “teach students with ASD” were

not specified, this item does not align with the theoretical construct of self-efficacy. In brief, this study revealed that one quarter of the respondents had no confidence to teach students with ASD in their general education classrooms and reported feeling "not at all prepared" to do so with nearly half reporting feeling only "somewhat prepared" to teach these students in inclusive classrooms.

Summary

From my review of the empirical research on teachers' beliefs about teaching students diagnosed with ASD I identified five tasks that general education teachers consider essential to successfully teach these students in general education classrooms: developing an understanding of students' needs, supporting students' social communication, managing challenging behaviors, adapting curriculum and instruction, and communicating and collaborating with interdisciplinary staff members working with the students and their parents. These five tasks not only make intuitive sense, but also are supported by the diagnosis literature and interdisciplinary research on ASD and align with high quality early childhood practice. My review also revealed that no teacher self-efficacy measure has been developed to date for use with general education teachers working with students with ASD in inclusive classrooms that specifically addresses the five identified teaching tasks. The purpose of this study was to develop and validate such a measure. Specifically, my goal was to create an instrument that can be used broadly by teacher educators and educational researchers to make valid inferences and evaluations about teachers' self-efficacy to carry out the identified tasks with students with ASD in inclusive educational settings.

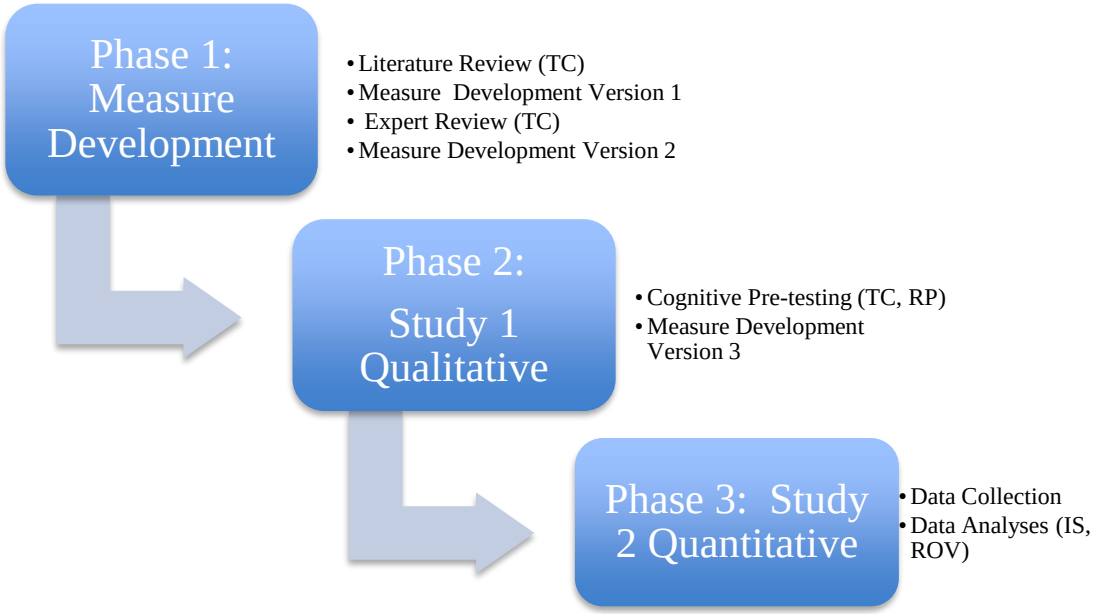
CHAPTER THREE: MULTI-METHOD STUDY DESIGN

The purpose of my research was to refine and validate the *Teacher Self-efficacy for Teaching Students with ASD in Inclusive Classrooms Scale (TSE-ASDI).* This instrument is intended for broad use by teacher educators and educational researchers to make valid inferences and evaluations about teachers' self-efficacy for teaching students diagnosed with ASD in inclusive early childhood educational settings. I examined the validity of this new scale for both pre-service and practicing early childhood teacher populations using a multi-method research design that included: cognitive pre-testing, factor analyses, correlational analyses, and group comparisons. Validation is the process of constructing and evaluating arguments for and against the relevance of the interdependence of a scale. I examined four sources of validity evidence: test content, response process, internal structure, and relation to other variables (AERA, APA, & NCME, 2014).

I incorporated the six-step approach to the development of new measures proposed by Gehlbach and Brinkworth (2011) and was attentive to the methodological implications for the development of self-efficacy scales resulting from previous research (e.g., Bandura, 2006; Klassen, Yerdelen, & Durksen, 2013; Ramirez, 2016; Ruble et al., 2013; Sharma, Loreman & Forlin, 2012; Siwatu, 2007; Tschannen-Moran & Woolfolk Hoy, 2001). Gehlbach and Brinkworth's (2011) six step process involves: 1) literature reviews; 2) interviews with target populations; 3) a synthesis of information from the literature review and interviews; 4) item development; 5) expert reviews; and 6) cognitive pre-testing. While I used this process as a starting point in the development of the

proposed scale, I refined it to meet my specific research needs. Similar to Gehlbach and Brinkworth (2011), I adopted a process that balances the use of qualitative and quantitative research techniques. My design reflects the three basic steps of the scale development process in the human and social sciences described by Morgado, Miereles, Neves, Amaral and Ferreira's (2017); item generation, theoretical analysis and psychometric analysis. The process I used is inherently collaborative in that it relies on comments and suggestions made by experts in the field as well as potential participants. I frontloaded the task of establishing validity to make the development process efficient by requiring fewer pilot tests. Figure 3.1 visually depicts the three phases involved in the development of the proposed teacher efficacy scale. As shown, each phase indicates the type of validity evidence used. I provide a detailed explanation of Phase 1: Measure Development in this chapter. In Chapter 4 I discuss the qualitative methods, findings and limitations of Phase 2: Study 1, and in Chapter 5 I discuss the quantitative methods, findings and limitations of Phase 3: Study 2.

Figure 3.1. Three phase development process



KEY: Validity evidence based on: TC - Test Content; RP - Response

Phase 1: Measure Development

In Phase 1 of this project I conducted a comprehensive review of the relevant literature, the results of which I reported in Chapter 2. In my review, I focused on the theory of self-efficacy and its influence on individuals, the construct of teacher self-efficacy and its influence on teacher practice and student achievement, measures of teacher self-efficacy used in the extant educational research, empirical research on teacher self-efficacy for teaching students with ASD, and tasks that teachers who work with this student population consider essential for effective teaching. Chapter 2 also included an in-depth review of scales used in the six studies that were conducted to date on teacher self-efficacy for teaching students with ASD. Using what I gleaned from my comprehensive review, I developed Version 1 of the TSE-ASDI Scale. I also solicited

feedback on that initial version of the scale from expert reviewers and used their comments and suggestions to develop Version 2 of the TSE-ASDI Scale. Below I describe these three steps, all of which added validity evidence on test content**.**

Literature Review

Defining the construct to be measured and writing items that accurately measure a multidimensional construct are two of the most important steps in scale development (DeVillis, 2003; Fives & Buehl, 2010; Gehlbach & Brinkworth, 2011; Wheatley, 2005). Limitations cited in previous studies of teacher self-efficacy (e.g., Tschannen-Moran & Woolfolk Hoy, 2001) and self-efficacy for teaching students with ASD (e.g., Ruble et al., 2011; Ruble et al., 2013) highlighted the need to more accurately define and operationalize the construct and generate items. Lack of clearly defined constructs have led to poorly written items in past teacher self-efficacy measures, thereby challenging the validity of those measures (Tschannen-Moran & Woolfolk Hoy, 2001). To define the teacher self-efficacy construct and avoid the validity problems identified by previous scholars, I first conducted a comprehensive literature review of teachers' beliefs for teaching students with ASD in inclusive classrooms (DeVillis, 2003; Gehlbach & Brinkworth, 2011; Schraw & Olafson, 2015). The results of that work are reported in detail in Chapter 2. Below I highlight issues of definitions that emerged in my review of the literature and which informed the development of Version 1 of the TSE-ASDI Scale.

Defining the Construct

A construct is the concept or characteristic that an instrument is designed to measure. It is a label for a cluster or domain of co-varying knowledge, skills, abilities,

traits, interests, processes, competencies or characteristics (AERA, APA, & NCME, 2014). When a construct is clearly articulated and the phenomenon it encompasses is clearly defined so that different people think similarly about it, it becomes a useful conceptualization tool that facilitates understanding and communication. As indicated earlier, the construct I was interested in studying and therefore needed to define was teacher self-efficacy to teach students with ASD in inclusive early childhood classrooms.

I chose to use Bandura's (1977) theoretical conceptualization of self-efficacy, a decision that led me to review previous self-efficacy scale development research using Bandura's theoretical lens (Klassen, Yerdelen, & Durksen, 2013; Ruble et al., 2013; Sharma, Loreman & Forlin, 2012; Siwatu, 2006; Tschannen-Moran & Woolfolk Hoy, 2001). Bandura (1977) described self-efficacy beliefs as domain, context, and task-specific. The ability of self-efficacy beliefs measures to predict future behavior and performance is dependent on whether the instrument assesses one's judgment of his or her capability to perform a specific realm of activity (domain) within a particular situation (context), and carry out clearly defined activities (tasks). In accordance with Bandura's theory, I defined the domain, context, and tasks of the construct I intended to measure.

Domain. The specific realm of activity under examination is that of teaching students with ASD. Drawing on definitions of teacher self-efficacy, teaching involves the act of bringing about desired outcomes for students (Bandura, 1986; Tschannen-Moran, Woolfolk Hoy & Hoy, 1998). As a result of the No Child Left Behind Act (NCLB, 2003)

and the Every Student Succeeds Act (ESSA, 2015), desired outcomes must be aligned with the general education curriculum for all students including those with ASD.

Context. The context is defined as the early childhood inclusive classroom. Early childhood educators are those professionals certified to work with children in pre-school through third grade. During these initial years of school, children typically stay in one classroom for the majority of the instructional part of the school day. As such, their education is the primary responsibility of one teacher or team of co-teachers for the entire school year. The focused attention of these educators on a small group of students as well as my own experience and expertise in the area of early childhood education serves as justification for my decision for this context.

The context also specifies inclusive classrooms. The Individuals with Disabilities Education Act (IDEA, 1990) and its reauthorizations in 1997 and 2004, as well as the No Child Left Behind Act (NCLB, 2003) and the Every Student Succeeds Act (ESSA, 2015) require that students with identified needs be given access to the general education curriculum in the least restrictive environment. This means, students between the ages of 3 and 21 who meet eligibility criteria in one of 13 qualifying federally defined categories of disability, including Autistic, are educated in general education or mainstream classrooms with nondisabled peers with the use of supplementary aides and services to the maximum extent possible. This practice is referred to as inclusion, and classrooms where this practice is in place are often referred to as inclusive classrooms.

Tasks. I identified five Autism Inclusion Tasks through my review of the literature on teachers' beliefs on working with students with ASD, the diagnosis

literature, and interdisciplinary research on ASD. These tasks include (1) developing an understanding of the needs of students with ASD through formal and informal assessment, (2) adapting curriculum and instruction for students with ASD, (3) managing challenging behaviors of students with ASD, (4) supporting the social communication of students with ASD, and (5) communicating and collaborating with interdisciplinary staff members working with and parents or guardians of students with ASD. These tasks comprise the dimensions of the TSE-ASDI Scale.

Other Teacher Self-Efficacy Measures

Through my literature review I found that no teacher self-efficacy measure has been developed to date to assess the multidimensional construct of teacher self-efficacy for teaching students with ASD specifically in inclusive early childhood classrooms. While Ruble et al. (2013) developed a teacher self-efficacy measure for use with teachers of students with ASD, the Autism Self-efficacy Scale for Teachers (ASSET) was designed for use with special educators and the context was not specifically defined as inclusive.

I also discovered through my literature review that no teacher self-efficacy measure related to ASD has been developed where the dimensions or tasks were based on teachers' beliefs. Gehlbach and Brinkworth (2011) discussed how researchers must "ascertain whether their newly refined conceptualization of the construct matches the way their prospective respondents think about it." It is therefore critical that the items on the TSE-ASDI Scale be based on tasks that teachers' identified as necessary to teach students with ASD in inclusive classrooms (p. 382). While the items in the ASSET reflect

tasks the authors, Ruble and colleagues (2013), considered most important for teachers of students with ASD, these tasks were not identified by teachers

Ruble et al. (2013) stated that the ASSET was developed to address limitations they identified in the Ruble et al. (2011) study. That is, that the measure used for evaluating self-efficacy did not adequately represent those instructional tasks most important for teachers of students with ASD. However, the items in the ASSET that were considered by Ruble et al. (2013) to be ASD specific tasks such as those in the 2011 version, had not been generated by teachers of students with ASD; instead they were identified by autism trainers in the local department of education and the guidelines provided by the National Research Council (2001). As stated above, my research design is intended to be collaborative, relying on experts in the field as well as the targeted participant populations to conceptualize the construct of teacher self-efficacy for teaching students with ASD in inclusive early childhood classrooms.

Development of Version 1

The second step in the measure development phase of my research was to develop Version 1 of the TSE-ASDI Scale to be reviewed by experts. This involved making decisions regarding three major elements of the measure: the directions, the items for each of the dimensions, and the response format. The TSE-ASDI Scale Version 1, along with the guidelines for providing feedback that I gave to the expert reviewers, appears in Appendix A.

Directions. Writing directions for this scale was a particularly difficult task due to the heterogeneity of the diagnosis of ASD (Kjelgaard & Tager-Flusberg, 2001;

McIntosh, Miller, & Shyu, 1999; Tager-Flusberg, 2006; Tomchek & Dunn, 2007). In the discussion section of their study, Ruble and colleagues (2011) hypothesized that some of their findings were related to the challenges teachers face in generalizing information learned from teaching one child with ASD to another child with ASD due to the heterogeneity in symptom presentation. I was confronted with this same challenge in developing the directions for Version 1 of TSE-ASDI Scale and discussed this issue in great detail with my advisors. I first considered creating vignettes of students with ASD and asking the participants to respond to the TSE-ASDI items relevant to each student described in the vignettes. Due to the heterogeneity of the ASD student population, I would need each participant to complete the TSE-ASDI relative to several vignettes in order to come close to representing the many possible presentations of the characteristics of students diagnosed with ASD. This approach would present a significant cognitive burden to the participants and I rejected it for this reason. I considered another approach to the presentation of the directions that involved providing participants a checklist and asking them to identify the characteristics of the child they kept in mind while responding to the items on the TSE-ASDI. With this approach, I would have needed to address these additional variables in the exploratory factor analysis with equal numbers of participants for each characteristic described. For example, I would have needed the same number of practicing teachers thinking about a verbal child with ASD as practicing teachers who reported thinking about a non-verbal child with ASD. I rejected this since such a large sample, particularly at this stage of measure development, would be untenable and the resulting items might be too specific for the broad intended use of this scale.

After exploring and rejecting these approaches to the directions for the first version of the TSE-ASDI, I chose to include directions similar to those used by Ruble et al. (2013) with modifications to the wording to allow use of the scale with both pre-service and in-service teachers. Rather than asking participants to rate their self-efficacy to perform a variety of tasks with a particular student in their classroom, I asked participants to think of a child or person with autism that they know (or were familiar with). Given the large sample of participants in my study, I believe that the heterogeneity of the individuals with ASD kept in mind by the participants represents the heterogeneity of the diagnosis of ASD.

Items. Finding the optimal level of specificity for measurement may be the greatest challenge to deciding how best to measure teachers' sense of self-efficacy (Tschaannen-Moran & Hoy, 2001). My goal was to capture the multifaceted dimensions of the construct without getting so specific that I jeopardized external validity and practical relevance (Pajares, 1996). Most scales or questionnaires regarding teachers' beliefs measure between one and four distinct dimensions and typically use 6 to 12 items to assess each separate dimension (Shraw & Olafson, 2015).

I identified five dimensions of teaching practice as necessary for meeting the needs of students with ASD in inclusive classrooms based on my review of the literature. These dimensions are described in detail in Chapter 2 as the Autism Inclusion Tasks. For the purpose of item generation. I viewed them as distinct dimensions and developed an initial set of six to ten items per dimension with a total of 38 items.

While developing these items I first revisited Table 2.1 in Chapter 2 in which I documented the items from the ASSET that aligned with the five Autism Inclusion Tasks. Next, I reviewed items from the three other TSE/ASD measures discussed in Chapter 2 (Brouwers & Tomic, 2001; Humphrey & Symes, 2013; Jennett et al., 2003) that aligned with the five Autism Inclusion Tasks as shown in Appendix B. I also reviewed the item phrasing of other self-efficacy measures to inform my own word choices (Klassen, Yerdelen, & Durksen, 2013; Ruble et al., 2013; Sharma, Loreman & Forlin, 2012; Siwatu, 2006; Tschannen-Moran & Woolfolk Hoy, 2001). In addition, I paid close attention to ensure that the wording of every item applied to every respondent (Gehlbach & Brinkworth, 2011). This was particularly important since I wanted to develop a measure that can be used with both pre-service and in-service teacher participants.

Response format. Bandura (1997) wrote that using too few response options in the measure of self-efficacy reduces the reliability of a measure. He argued that it risks differentiating information as participants who use the same response category would differ if more response options were available. Bandura used a 0 to 100 point response scale that was found by some researchers to be psychometrically stronger than a traditional Likert-type scale (Pajares, Hartley & Valiante, 2001). The 0-100 response format recommended by Bandura (1997) continues to be used in contemporary teacher self-efficacy research (Siwatu, 2007); however a Likert-type response is very common in recently developed teacher self-efficacy measures (Browers & Tomic, 2001; Ruble et al., 2013; Tschannen-Moran & Woolfolk Hoy, 2001). I chose a 9-point scale for each item

comprising initial draft of the TSE-ASDI Scale with anchors at 1-cannot do at all. 5-moderatly certain I can do, and 9-highly certain can do.

Expert Review

The third step in the measure development phase of my research was conducting an expert review to gather content-oriented validity evidence for the TSE-ASDI Scale. Since the intended use of this scale is to measure the construct of teacher self-efficacy for teaching students with ASD in inclusive classrooms, I consulted experts from the fields of ASD, inclusion, and teacher self-efficacy to collect evidence that established the construct relevance of individual items (Gehlbach & Brinkworth, 2011). The names, qualifications and relevant experiences of each expert reviewer are documented in Appendix C. The experts were asked to review the measure based on their area of expertise. They were specifically asked to use track changes in their word processing programs to provide feedback based on their assessment of the degree to which each item accurately/adequately tapped into the target dimension (directions for the Expert Reviewers and TSE-ASDI Version 1 are included in Appendix D).

The feedback provided information that fell into three distinct categories: feedback on directions to the participants, feedback on dimensions, and feedback on individual items. A synthesis of the feedback and my actions for each of these categories is provided in Appendix E. The feedback on the directions for completing the scale included concern that a participant may not know or be familiar with a child with ASD. In response to this concern, I asked all the participants in my qualitative study, those with and without identified experience with a child with ASD, if they were able to keep a child

in mind while responding to the items. I also included "No experience with individual with ASD" as a possible answer to the question "What is your experience with individuals diagnosed with autism spectrum disorder (ASD)?" on the demographic and background characteristics survey. Since adult participants were being asked about various relationship categories (e.g. sibling of individual with ASD, relative/friend of individual with ASD) the term "individual" rather than "child" was used in some of the answers.

Another concern was how the age of the child that the participant knew might influence that participant's responses to the items. I addressed this concern by limiting the age of the child in the directions specifically to early childhood (ages 3-8). Finally, the remaining concerns with the directions had to do with the heterogeneity of the population of children with the diagnosis and how this would influence participants' responses. This is a legitimate concern and I discussed how I addressed this issue above in the section that describes the development of the directions. I also address this in the limitations of Study 2, in Chapter 5.

The feedback on the dimensions was limited to two of the five dimensions; Dimension 1: Develop an understanding of the needs of the students with ASD through formal and informal assessment and Dimension 5: Communicate and collaborate with inter-disciplinary staff members. I synthesized the details of the suggestions for each of these dimensions and the justification for my changes in Appendix E and discuss the changes to the wording of these dimensions in the Measure Development Version 2 section below.

The concerns noted by the expert reviewers about individual items fell into three broad categories: the need to refine and/or clarify the meaning of particular terms, the need to collapse or separate double-barreled items, and the need to reduce the cognitive burden on the participant due to length or repetition of items. The details of each of these concerns along with my justification for addressing or rejecting suggestions presented by the expert reviewers is also included in Appendix E.

Measure Development Version 2

The fourth and final step in the measure development phase of my research was revising the TSE-ASDI Version 1 based on the feedback from expert reviewers. I revised the scale as detailed in the action steps in Appendix E with the goal of creating the second version of the TSE-ASDI Scale for use during the qualitative portion of my dissertation study (i.e. Phase 2). Most notably, I amended the directions to focus specifically on early childhood (ages 3 to 8). I also revised the titles of Dimensions 1 and 5 to refine the wording based on the input from the experts. Dimension 1 was amended to *Develop an understanding of students with ASD* and Dimension 5 to *Collaborate with interdisciplinary team members including families.* Finally, I collapsed and eliminated some items resulting in six fewer items and flagged certain terms for clarification during the cognitive pre-testing with pre-service and in-service teachers that is discussed below. The TSE-ASDI Scale Version 2 is included in Appendix F.

Conclusion

In this chapter I described a three-phase process for the development and validation of the TSE-ASDI Scale to measure the construct of teachers' self-efficacy for

teaching students with ASD in inclusive early childhood classrooms. This instrument is intended for broad use by teacher educators and educational researchers to make valid inferences and evaluations about teachers' self-efficacy to carry out identified tasks with students diagnosed with ASD in inclusive educational settings.

In Phase One: Measure Development, discussed in this chapter, I completed my literature review, developed Version 1 of the TSE-ASDI Scale, gathered feedback from expert reviewers in the fields of autism, inclusion and teacher self-efficacy, and used this feedback to develop Version 2 of the TSE-ASDI Scale. I discuss the methods, findings and limitations of Phase Two, my qualitative study, in Chapter 4. This study included cognitive pre-testing and the second round of revisions revision of the TSE-ASDI Scale. Finally, I discuss the methods, findings and limitations of Phase Three, my quantitative study in Chapter 5. This involved running a pilot study using the TSE-ASDI Scale Version 3, a demographic survey as well as the TSES (Tschannen-Moran & Woolfolk Hoy, 2001) and conducting an exploratory factor analysis, reliability analyses, correlation analyses, and group comparisons.

CHAPTER FOUR: STUDY ONE QUALITATIVE

The second phase of this dissertation project was a qualitative study designed to gather further content-oriented evidence as well as response process evidence for the validity of the TSE-ASDI Scale by determining if participants from the target populations of pre-service and in-service early childhood teachers interpreted the directions and items as intended (Collins, 2003; Gehlbach & Brinkworth, 2011; Karabenick, et al. 2007). It involved cognitive pre-testing interviews and a second round of revisions to the TSE-ASDI Scale based on feedback from theses interviews. This study enabled me to explore potential sources of measurement error with the TSE-ASDI Scale related to how and where the scale may fail to achieve its measurement purpose (Beatty & Willis, 2007; Collins, 2003; Gehlbach & Brinkworth, 2011; Willis, 2005).

I employed cognitive pre-testing, a field research method used to pre-test survey instruments, to ensure that the TSE-ASDI Scale met its purpose (Collins, 2003; Willis, 2005). There are two main methods of cognitive pre-testing interviews: think-aloud and verbal probing (Beatty & Willis, 2007; Collins, 2003). Think-aloud procedures call for the participant to read each question aloud and to think through their response aloud. Verbal probing involves the interviewer asking the participant to respond to each question followed by targeted questions to explore the participant's beliefs and understanding in an in-depth manner. There are pros and cons to each of these approaches.

The main advantage of think-aloud procedures is that they use a simple to implement standardized probe, thereby reducing bias that might be introduced by the

interviewer. Among the disadvantages of think-aloud procedures is the cognitive burden placed on respondents to create a response without the support and guidance of probing questions (Beatty & Willis, 2007, Collins, 2003). Additionally without further prompting it is possible to get little useful information and much of the information obtained could be irrelevant (Beatty & Willis, 2007; Willis, 2005). The salient advantage of verbal probing is the control the interviewer has in requesting desired information from the participant. Carefully selected probes help to focus participants' attention to relevant issues that may generate verbal material that is useful in evaluating the content of each item and its relation to the construct that a scale is intended to measure (Beatty & Willis, 2007).

Cognitive pre-testing that combines the strategies used in think aloud procedures and verbal probing can be used together effectively to determine not only if there is a problem with an item conveying its intended meaning but also diagnosing what that problem is (Beatty & Willis, 2007, Collins, 2003; Willis, 2005). This is especially true when someone with knowledge of the questionnaire and the objectives of the specific questions can serve as an active cognitive interviewer (Beatty & Willis, 2007). In this study, I served as the informed, active cognitive interviewer and used a cognitive pre-testing protocol that combined think aloud procedures and verbal probing. In order to reduce the risk of my bias for the wording of items influencing my findings, I pre-determined the probes I used during the interviews.

Two questions guided this research:

Study 1 RQ1. How do respondents interpret the directions?

Study 1 RQ2. How do respondents interpret each item?

My goal was to ensure that the directions and each item successfully captured my intended meaning and made sense to the respondent. I used the data or information collected during this study to refine the wording of the directions and to identify items that needed revisions or could be omitted. This resulted in a second round of revisions to the TSE-ASDI Scale prior to the large-scale pilot test.

Methodology

Participants

I conducted cognitive pre-testing interviews with eight participants in total, four from my target population of pre-service early childhood teachers and four from my target population of in-service early childhood teachers in general education classrooms. I used purposeful, convenience sampling to select the participants as detailed in Table 4.1. Two of the pre-service teachers were undergraduate students in their first year of early childhood (P-3) teacher preparation and two were graduate students in dual-certification (P-3 and TSD) teacher preparation programs. All four of the in-service teachers taught in general education early childhood classrooms.

Including participants that represented the categories of teaching status (pre-service vs. in-service), experience with an individual with ASD and special education preparation was important for my study based on my interest in examining if findings related to these categories in previous teacher efficacy literature were replicated when teacher efficacy was assessed by the TSE-ASDI Scale in my quantitative study. Specifically, in each of the identified pre-service teacher categories (undergraduate and

graduate) I recruited one person with experience (i.e., as a paraprofessional) with a child with ASD and one person who did not have experience as a parent, sibling, teacher, paraprofessional, service provider or friend of a child with ASD. Similarly, in each of the identified in-service teacher categories (with and without Teacher of Students with Disabilities, TSD, certification) I recruited one person with and one without experience with a child with ASD. I recruited each participant via personal contacts.

All of the eight participants were female. Seven were studying or teaching in New Jersey. One of the in-service teachers taught in an early childhood general education classroom in Canada.

Table 4.1

Cognitive Pre-testing Purposeful Sampling Criteria

Target Population	Participants			
Pre-Service Early Childhood Teachers (P-3)	Participant 1 First year of P-3 teacher preparation undergraduate No experience with child with ASD	Participant 2 First year of P-3 teacher preparation undergraduate Experience with child with ASD	Participant 3 Masters level Dual-certification program- P-3 and TSD No experience with child with ASD	Participant 4 Masters level Dual-certification program; P-3 and TSD Experience with child with ASD
In-Service Early Childhood Teachers In General Education Classrooms (P-3)	Participant 5 No TSD certification No experience with child with ASD	Participant 6 No TSD certification Experience with child with ASD	Participant 7 TSD certification No experience with child with ASD	Participant 8 TSD certification Experience with child with ASD

Procedures

Seven of the cognitive interviews were conducted in person and the participants signed the consent document found in Appendix G. I gave these participants a paper copy of Version 2 of the TSE-ASDI to read while I conducted the interview. The cognitive interview with the in-service early childhood teacher with no Teacher of Students with Disabilities certification but with experience with children with ASD was conducted via Skype since she resided in Canada. She was e-mailed a different version of the consent document that described the process for Skype interview found in Appendix H. She returned a signed copy of this consent form and was e-mailed Version 2 of the TSE-ASDI to read as I conducted the cognitive interview.

Data Sources

In this study I served as an active cognitive interviewer using a semi-structured interview protocol that combined think aloud and verbal probing strategies found in Appendix I. The protocol includes two types of standardized probes, anticipated and conditional, that I wrote ahead of the interviews. I used anticipated initial probes with each participant to allow me to discern their interpretation of the directions and of each item on the scale. I also used anticipated probes to clarify each participant's understanding of terms that my expert reviewers felt may be unclear to my target population. Included in the protocol are conditional probes I used when I detected a certain participant exhibited hesitation or confusion in their response. Finally, as an interviewer with knowledge of the questionnaire and the objectives of the specific

questions, I sometimes used emergent probes (i.e., unscripted and reactive to participant responses) to further clarify responses if necessary (Beatty & Willis, 2007).

From these interviews three data sources emerged audio recordings of the interviews, transcriptions of the recordings, and field notes. All eight participants consented to having their interview audio recorded. The interviews lasted between 35 and 50 minutes and I transcribed the audio recordings of each. As the participants responded to items, I took field notes to aid me in determining if conditional probes were necessary for participants who had difficulty putting the directions or items into their own words, picking a child to keep in mind while completing the scale, picking a response to a particular question, or defining a particular term.

Data Analysis

To answer my two research questions, I analyzed my field notes and my transcriptions of the interview responses of each participant in search of recurring patterns (Merriam, 2009). I looked closely at specific components of the question-and-answer process with the goal of identifying potential sources of measurement error (Collins, 2003). For example, one participant replied, “I am not sure what you are asking” after reading an item. This lack of clarity of the intended meaning of the item could lead a participant to not respond to an item or respond based on an unintended meaning. I developed a meta-matrix including the responses of each participant to the instrument directions and each item (Miles & Huberman, 1994). This meta-matrix helped me to compare across participants and items for key issues of comprehension and interpretation.

A synthesis of these key issues is provided in Tables 4.2 through 4.4 and discussed below.

There are mixed views in the literature on cognitive interviewing regarding rationale or protocol for accepting or discarding feedback from participants. Beatty and Willis (2007) stated that it is "conceivable that a solid argument about a questionnaire problem could be constructed around a single case" (p. 302). However, Gehlbach and Brinkworth (2011) cited Willis (2005) when they raised concerns about survey designers overthinking their items during cognitive interviewing sessions. They recommend identifying clear trends from more than one respondent before making changes to a potentially problematic item. I took the later approach and looked for trends in participant responses regarding their understanding and ability to respond to the directions and individual items in my scale. Because I had only eight participants in Study One, a trend could be established by 2 of the 8 or 25% of the participants exhibiting some confusion or misinterpretation of the directions or of an item that differed from my intended meaning. My analysis was strictly based on their interpretation of the directions and items and their reported ability to respond to an item. It was not based on the type of self-efficacy rating they gave themselves.

Findings

My review of the data revealed findings related my two research questions for this study. Issues on interpreting the directions (S1-RQ1) related to the context and how to complete the instrument. Issues related to item interpretation (S1-RQ2) were framed as issues of (1) item duplication, (2) wording of items, and (3) lack of clarity in the

examples. In the sections below I describe these findings and the resulting changes made to the TSE-ASDI Version 2 based upon them.

Research Question 1: How do Respondents Interpret the Directions?

As part of the cognitive interview, I asked participants if they were able to select a child to keep in mind while completing the scale. All participants were able to briefly describe a child diagnosed with ASD, between the ages of 3 and 8. There were, however, two aspects of the directions for completing the scale that needed clarification in order to communicate the intended meaning, one regarding context and one regarding how to complete the scale. A description of each needed clarification and the actions taken are shown in Table 4.2 and discussed below.

Table 4.2

Qualitative Interview Feedback: Directions

Nature of Feedback	Description	Action
Directions	Clarification about tasks taking place in the context of a general education/inclusive classroom	Added "in an inclusive classroom."
	Specifics of how to complete scale	Added "by circling the number on the scale."

Context. The directions for the TSE-ASDI Scale Version 2 read: Think of a child between the ages of 3 and 8 with autism that you know (or are familiar with). The list below describes several activities for working with children with autism. Please indicate

how confident you are that you can do each of these activities for the child you are thinking about.

As I was conducting the first interview I realized that these directions did not capture the context I had outlined when defining my construct of teacher self-efficacy for teaching students with ASD in *inclusive* early childhood classrooms. While asking participants to "think of a child between the ages of 3 and 8" ensured the context of an early childhood classroom (i.e. pre-school to third grade), I had not specified that I wanted participants to rate their confidence in their ability to carry out the identified tasks in the context of an inclusive classroom. Therefore, I clarified this for the first participant and revised the directions for the remaining seven interviews to read:

> Think of a child between the ages of 3 and 8 with autism that you know (or are familiar with). The list below describes several activities for working with children with autism. Please indicate how confident you are that you can do each of these activities for the child you are thinking about in an inclusive classroom.

I made this revision to Version 3 of the TSE-ASDI Scale.

How to complete the scale. During the cognitive interviews participants were asked to read each item aloud, put the question into their own words, think aloud about their thoughts while answering the question, and share what score they would give themselves for each item. They were not asked to complete the scale with respect to their own self-efficacy assessments. Participant 1 and Participant 5 required more specific information about how to complete the scale. Specifically, Participant 5 asked, "Would I circle my answer?" and I verbally explained that one would circle the number of their

response for each item. I added, “by circling the number on the scale” to the directions for Version 3 of the TSE-ASDI Scale.

Research Question 2: How do Respondents Interpret Each Item?

There were several ways that items needed to be revised in order to convey the intended meaning. Participants found several items redundant and were confused by the wording and/or the examples provided for several items.

Duplication of item content. Participants’ responses indicated that two items on Version 2 of the TSE-ASDI needed to be combined and two items could be deleted because the content of the items was so similar that they could not distinguish their answers. Details of the description of each repetitive item and actions I took to eliminate duplication are summarized in Table 4.3 and examples of participants’ feedback to a few of these items are described below.

Issues of content duplication emerged among items three, four, and ten. Items 3 “How confident are you that you can recognize sources of stress for this student” and 4 “How confident are you that you can understand when this student’s behavior is related to stress” were perceived to be connected and there was also overlap in meaning with item 10 “How confident are you that you can identify the underlying cause of challenging behavior exhibited by this student.” Two participants (i.e., 2 and 6) indicated duplicate meaning for items 3 and 4. Specifically, Participant 6, stated, “This goes up above to what I was just saying… I think I see these two things (items 3 and 4) as connected” and Participant 2 explained, “It would be difficult to recognize stress for both these items. I know everything upsets them.” Participant 2 also commented after reading item 10, “It is

Table 4.3

Qualitative Interview Feedback: Duplication of items on Version 2 (V2) of the TES-ASDI Scale

V2 Item(s)	Action
V2 Items 3, 4, 10: Too similar	
V2 Item 3- Recognize sources of stress for this student (e.g., sensory stimulation, motor demands, expressive communication challenges, comprehension challenges, changes in routines or schedules, the emotions of another person)? V2 Item 4- Understand when this student's behavior is related to stress (i.e., hitting, fleeing, rocking, withdrawing)?	Combined Items 3 & 4 into one new item: Recognize things that this student finds challenging or upsetting (e.g., loud noises, handwriting, expressive communication, comprehension of language or text, changes in routines or schedules, the emotions of another person)?
V2 Item 10- Identify the underlying cause of a challenging behavior exhibited by this student (e.g., sensory stimulation, motor demands, expressive communication challenges, changes in routines or schedules, the emotions of another person)?	Reworded Item 10: Identify why this student might be exhibiting a challenging behavior (e.g., sensory stimulation, motor demands, expressive communication challenges, changes in routines or schedules, the emotions of another person)?
V2 Items 5 and 7: Examples too similar	
V2 Item 5- Understand this student's ability to use symbols to represent ideas (e.g., pictures, picture symbols, spoken word, text)? V2 Item 7- Provide multiple ways to allow this student to express him or herself during a lesson or activity (e.g., pictures, picture symbols, voice output, writing, typing)?	Deleted V2 Item 5: Participants restated item 5 using term "express" found in item 7.
V2 Items 12 and 15 interpreted in the same way	
V2 Item 12- Replace challenging behavior of this student with another way of communicating.	Deleted V2 Item 12: Participants restated both items using terms "giving student ways to communicate."

V2 Item(s)	Action
V2 Item 15- Facilitate this student's ability to communicate ideas to familiar adults?	

not difficult to recognize challenging behavior but it is difficult to know what is causing it." A second participant (Participant 1) replied after reading item 10, "This reminds me of another item" and turned back and pointed to item 4. Based on this feedback, items 3 and 4 were combined and item 10 was reworded (See Table 4.3).

In addition, based on concerns about duplication expressed by participants, items 5 and 12 were deleted. Specifically, participants 4 and 6 found item 5 to be too similar to item 7. Participants 4 and 6 also had responses to item 12 that were very similar to their responses to item 15. Additionally, Participant 6 expressed difficulty understanding the meaning of item 12 and Participant 3 commented that the content in item 12 was used as an example in item 10. These changes are detailed in Table 4.3

Difficulty with item wording. My use of the think aloud strategy during the cognitive pre-testing interviews allowed me to gain information on the participants' comprehension problems or misinterpretation of individual items due to vocabulary or grammatical structure. Based on the recommendations of participants I combined three items and reworded eleven items. Below, I describe the concerns with each of the items that led to revisions and Table 4.4 provides details of the changes.

Table 4.4

Qualitative Interview Feedback: Revision to TSE-ASDI V2 based on Item Wording

V2 Item(s)	Action
V2 Item 6- Modify lessons to meet the representational level of this student (e.g., pictures, picture symbols, dictation, voice output, text)?	Changed to: Modify how lessons are presented to allow this student to understand the content (e.g., provide visuals, reduce language)?
V2 Item 7- Provide multiple ways to allow this student to express him or herself during a lesson or activity (e.g., pictures, picture symbols, voice output, writing, typing)?	Changed to: Provide multiple ways for this student to express his or her answers or ideas during a lesson or activity (e.g., pointing to pictures or picture symbols, speaking, typing)?
V2 Item 8- Make modifications to the grade level curriculum content so this student can engage in curricular activities (i.e., participate in a math lesson, contribute to a group project)?	Changed to: Plan curricular activities (i.e., math lessons, science group project) to allow this student to actively participate?
V2 Item 17- Support peers' ability to understand the meaning of what this child is communicating to them?	Changed to: Help classmates to understand what this child is communicating to them?
V2 Item 18- Support this child's ability to understand the meaning of what familiar adults are communicating?	Changed to: Help this child understand what familiar adults are communicating to him or her?
V2 Item 19- Support this child's ability to understand the meaning of what peers are communicating?	Changed to: Help this child understand what classmates are communicating to him or her?
V2 Item 23- Explain your academic challenges with this student to an interdisciplinary colleague? V2 Item 24- Explain your social communication challenges with this student to an interdisciplinary colleague? V2 Item 25- Explain your behavioral challenges with this student to an interdisciplinary colleague?	Combined V2 Items 23, 24 & 25 into one new item: Explain the challenges you are having with this student to an interdisciplinary colleague (e.g., speech & language therapist, occupational therapist, another teacher) in order to seek strategies and interventions to use in your classroom?

V2 Item(s)	Action
V2 Item 26- Plan lessons cooperatively with interdisciplinary colleagues?	Changed to: Plan lessons cooperatively with interdisciplinary colleagues (e.g., speech & language therapist, occupational therapist, another teacher) who are working with this student?
V2 Item 27- Incorporate strategies provided by interdisciplinary team members, including families, into your accommodations and modifications for this student?	Changed to: Incorporate strategies provided by others who know this student well (e.g., speech & language therapist, occupational therapist, another teacher, parents, caregivers) into your accommodations and modifications?
V2 Item 28- Define explicit tasks for working with this student to paraprofessionals?	Changed to: Delegate explicit tasks to the paraprofessionals/educational or teaching assistants working with this student?
V2 Item 29- Coach paraprofessionals in their assigned tasks for working with this student?	Changed to: Coach paraprofessionals/educational or teaching assistants working with this student?

A clear example of item-wording concerns emerged as participants read and responded to items 5, 6, and 7. Specifically, confusion around the use of the term "represent" and "representational" in items 5 and 6 respectively led participants to interpret items 5, 6, and 7 in ways that were not aligned with my goals for these items. My original wording of item 5 "How confident are you that you can understand this student's ability to use symbols to *represent* ideas" seemed to steer several participants to interpret the meaning of "representational" in item 6 "How confident are you that you can modify lessons to meet the representational level of this student" to mean expressive communication level. This misunderstanding then seemed to confuse the interpretation of

the difference between item 6 and item 7 “How confident are you that you can provide multiple ways to allow this student to express him or herself during a lesson or activity.” For example, Participant 8 commented, “That is what I thought number 6 meant” after reading item 7. Therefore, I reworded item 6 to “How confident are you that you can modify how lessons are presented to allow this student to understand the content.” I also reworded item 7 to “How confident are you that you can provide multiple ways for this student to express his or her answers or ideas during a lesson or activity” and provided more explicit examples (See Table 4.4 above). Item 5 was ultimately dropped do to duplication issues as indicated in Table 4.3.

Item 8 was reworded as noted in Table 4.3 to incorporate the term “plan” used by the two under-graduate participants (Participants 1 and 2) when they put the item in their own words. Similarly, the term “support” was changed to “help” in items 17, 18 and 19 to reflect the language used by all of the participants when they put these items into their own words.

Items 23, 24 and 25 related to the task of the teacher explaining to an inter-disciplinary colleague the challenges (academic, social communication, and behavioral) the teacher experienced with the student with ASD. The first issue with these three items was the term “inter-disciplinary.” While this term was not flagged as problematic during the expert review it was a term that seemed unclear to four participants (Participant 1, 2, 4, and 6). As a result of this pattern of confusion, I used verbal probing to discern each participant’s interpretation of this term. The initial responses by each of these participants demonstrated that they might not understand the term in the way I intended which was

professionals from other education or allied health disciplines (i.e., speech and language therapists, occupational therapists, physical therapists, special educators, school counselors, school psychologists, and/or behaviorists). For example, when probed about their understanding of the term "inter-disciplinary colleague" Participant 4 replied, "Someone who is in the same type of work as you but not someone in your exact position but someone who understands" and Participant 6 stated, "I am not sure if what you are asking is to explain to a prep coverage teacher [a staff member covering the classroom during a teacher's curriculum preparation time] or resource teacher [who is this?]."

The second issue with items 23, 24 and 25 was that the task of explaining one's challenges with a student to another professional rather than the particular challenge appeared to dominate the task. This was true for Participants 1, 2, and 4. For example, Participant 2 feared that others may think she was unable to do her job and Participant 4 gave replies to each of these items that indicated she believed she would be hesitant to speak with other professionals because she questioned her own knowledge. Specifically her responses to these items were as follows:

- Item 23 "How confident are you that you can explain your academic challenges with this student to an inter-disciplinary colleague?"
    - Response, "So it means to engage in discussion about this child's academic needs with my peers. I would give myself a rating of 7 because sometimes I question myself and my knowledge so I might be a little stand-offish with someone who I think might know more than I do even

though I am the one with the student all day. I might hold info back if I am not so sure about it**.**

- Item 24 “How confident are you that you can explain your social communication challenges with this student to an inter-disciplinary colleague?”
    - Response, “Discussing the communication challenges with my peers. Same rating a 7. I think I know the child fairly well but I might not divulge all that I have to offer because I might feel a little shy maybe not the right word or uncertain.”
- Item 25 “How confident are you that you can explain your behavioral challenges with this student to an inter-disciplinary colleague?”
    - Response, “Discussing the behaviors of this student with peers. Rating is same 7. I feel that I know what they are but I might be uncertain about describing them to others.

Based on the above responses to items 23, 24 and 25, I combined these three items, clarified the reason one might collaborate with a colleague, and provided an example for the term inter-disciplinary. The new item was worded, “How confident are you to explain the challenges you are having with this student to an inter-disciplinary colleague, (e.g., speech and language therapist, occupational therapist, another teacher) in order to seek strategies and interventions to use in your classroom?”

The term “interdisciplinary” appeared in items 26 and 27 as well. Based on the lack of clarity with this term, as stated above, I revised item 26 by including the example

"speech and language therapist, occupational therapist, another teacher." In item 27, "Incorporate strategies provided by interdisciplinary team members, including families, into your accommodations and modifications for this student", the recommendation to include the mention of families in this item came from the expert review and because families as well as professionals were referred to in this item I reworded it as follows "Incorporate strategies provided by others who know this student well (e.g. speech & language therapist, occupational therapist, another teacher, parents, caregivers) into your accommodations and modifications." Two participants (Participant 1 and 6) needed clarification of the term "paraprofessional" when they read item 28. Therefore, I added "education or teaching assistant" to items 28 and 29 where the term paraprofessional appears. All of these changes are indicated in Table 4.4.

Difficulty with examples only. Two items surfaced concerns that were specifically related to the examples used. First, item 20 read "Support the participation of this student in structured social activities (e.g., playing board games)." The example "playing board games" elicited a clearer example from participants for this item in their restating of the item. One pre-service (Participant 3) and three in-service teachers (Participants 5, 7, and 8) referenced the terms "follow the rules" or "rule-based games," therefore I changed the example to "rule-based games." Second, item 21 stated "Support the participation of this student in unstructured social activities (e.g., engaging with peers during lunch and recess.)" All four in-service teachers (i.e., Participants 5, 6, 7, 8) explained that they typically are not with their students during lunch and recess because that is when they have their own lunch break. Participant 8, provided the example of free-

play as unstructured time. I therefore, added this to the example for this item. The use of think aloud allowed me to gather participants' recommendations for examples to use in these two items.

Limitations

As with any study this one had limitations. One limitation of this study is the use of purposeful convenience sampling to select participants. Although I purposefully identified one participant to meet each of the eight categories of early childhood teachers as described in Table 4.1 above, I conveniently selected the participants based on accessibility to them. The inherent bias in convenience sampling means that the sample is unlikely to be representative of my target population of pre-service and in-service early childhood teachers.

A second limitation of this study was the possible bias I brought to my role as an active cognitive interviewer. Since I developed the directions and the items in the TSE-ASDI Scale I served as active interviewer with knowledge of the questionnaire and the objectives of the specific questions. Therefore, I was able to go beyond the standardized anticipated and conditional probes and use emergent probes when I needed more clarification on a participant's response. According to Beatty and Willis (2007), emergent probes may sometimes allow an interviewer to steer participants to desired interpretations of an item. Also, my knowledge of autism from my professional experiences may have

influenced the way I interpreted participants' responses causing me to assume they had a deeper understanding than was accurate.

Discussion

The purpose of this study was to gather further content-oriented evidence as well as response process evidence for the validity of the TSE-ASDI Scale by determining if the target population of pre-service and in-service early childhood teachers interpreted the directions and items as intended. My goal was to make the necessary revisions to the TSE-ASDI scale to ensure that the directions and each item successfully captured my intended meaning and made sense to the respondent before the pilot test. This empirical investigation was a qualitative inquiry involving cognitive pre-testing with a sample from my target population.

I found possible sources of measurement error relative to my first research question: How do respondents interpret the directions? The lack of clarity regarding the inclusive nature of the context in my original wording of the directions (Version 2) could have influenced participants' responses since self-efficacy beliefs are not only domain, and task specific, but also context specific (Bandura 1986). I added the phrase "in inclusive classrooms" to the directions since my goal with the TSE-ASDI is to measure the construct of teacher self-efficacy for teaching students diagnosed with ASD in *inclusive* classrooms.

I found other possible sources of measurement error relative to my second research question: How do respondents interpret each item? First, participants' responses indicated that several items were interpreted as being repetitive or describing similar

tasks. Therefore, I combined two items and deleted two other items as shown in Table 4.3.

Second, participants' responses indicated that the wording of thirteen items was unclear or did not convey my intended meaning as shown in Table 4.4. Interestingly, only one of the terms, "representational," flagged during the expert reviews caused confusion. As such, I removed this term and reworded the item was reworded to more clearly convey my intended meaning. Another term, "interdisciplinary," not flagged during the expert review appeared in several items and required clarification. Finally, participants indicated that examples provided in two items did not clearly convey experiences they would have in early childhood classrooms. Therefore, I revised those examples. The result was four fewer items in Version 3 of the TSE-ASDI Scale, reducing the set of 32 items tested to 28 items (See Appendix L).

My revisions to Version 2 of the TSE-ASDI scale based on this qualitative analysis of participant responses to cognitive interviews provided content-oriented and response process evidence of validity for this instrument.

Conclusion

In this chapter I described how I used cognitive interviews of pre-service and in-service early childhood teachers to ensure that the TSE-ASDI was a qualitatively sound instrument before engaging in exploratory analysis in the quantitative phase of my study. After completing the cognitive interviews using the 32 item Version 2 of the TSE-ASDI and analyzing the responses, I revised the scale and used the 28 item Version 3 in the quantitative study discussed in Chapter 5.

CHAPTER FIVE: STUDY TWO QUANTITATIVE

The third and final phase of my measure development process provided evidence for validity based on the internal structure of the instrument as well as evidence based on relations to other variables. In Study Two I addressed the following research questions:

Study 2 RQ1. What is the emergent factor structure of the TSE-ASDI Scale?

Study 2 RQ2. Does, and if so how, the factor structure of the TSE-ASDI Scale differ for pre-service and in-service early childhood teachers?

Study 2 RQ3. Do the data reflected in the emergent factors for the whole sample and the pre-service and in-service samples demonstrate acceptable reliability scores?

Study 2 RQ4. Are scores on the TSE-ASDI sub-scales positively correlated with an existing measure of teacher self-efficacy (e.g., TSES, Tschannen-Moran & Woolfolk Hoy, 2001)?

Study 2 RQ5. Are previous findings in the teacher efficacy literature, with respect to teaching status (pre-service vs. in-service), special education certification, and experience with individuals with a diagnosis of ASD, replicated when teacher efficacy is assessed by the TSE-ASDI Scale?

Methodology

Participants

Participants (n = 289) consisted of 279 females (97%) and 10 males (3%). In addition, 223 reported they were White (77%), 25 Black/African American (9%), 24 Hispanic/Latino (8%), 6 Asian (2%), 3 American Indian/Alaskan Native (1%), 2 Native

Hawaiian or Pacific Islander (1%), and 6 self-described (2%). All of the participants were from the United States and half of them were under 30 years old (See Table 5.1).

Table 5.1

Ages of Study Two Participants

	Frequency	Percentage
20-24	94	33
25-29	51	17
30-34	33	11
35-39	25	9
40-44	19	7
45-49	12	4
50-54	20	7
55-59	17	6
60-64	15	5
65-69	2	1

1 Missing Age Range

The 289 participants included 156 practicing early childhood teachers (54%) and 133 pre-service early childhood teachers (46%). Of the 133 pre-service teachers, 84 were graduate students (63%) and 49 were undergraduate students (37%). Of the 289 participants in the study, 49 were working towards their bachelors degree (17%) and 155 held a bachelor's degree as their highest level of education (54%). Additionally, 55 held a master's degree (19%), 26 held a master's degree plus additional coursework (9%) and 4 held a doctoral degree (1%). The 133 pre-service teachers sought certifications in Pre-K to 3rd grade (n = 23; 18%), kindergarten to 6th grade (n = 20; 15%), Pre-K to 3rd grade and

TSD (*n* = 43; 33%), Kindergarten to 6th grade and TSD (*n* = 42; 32%), as well as one each of TSD only and Pre-K to 6th grade. Three of the pre-service participants did not indicate a pre-service certification but two of these participants listed themselves as working with young children under the teacher certification "Other" category.

The teaching certifications held by the 156 in-service teachers included, Pre-K to 3rd grade (*n* = 42; 27%), Kindergarten to 6th grade (*n* = 20; 15%), Pre-K to 6th grade (*n* = 15;10%), TSD (*n* = 22; 14%), Pre-K to 3rd grade and TSD (*n* = 26; 17%), Kindergarten to 6th grade and TSD (*n* = 18; 11%), and Pre-K to 6th grade and TSD (*n* = 4; 3%). Eight of the in-service teachers listed themselves as working with young children under the "Other" category (5%) and one did not list a teacher certification. These nine participants indicated that they were teaching in pre-school therefore it is possible that they were not certified since teacher certification is not required in most private pre-school programs. Because they did not indicate that they were working toward a teacher certification, I included them in the in-service category.

Of the 156 practicing teachers, 60% indicated that they were teaching pre-K (*n* = 93), 10% were teaching kindergarten (*n* = 16), 3% were teaching first grade (*n* = 5), 4% were teaching second grade (*n* = 6), 8% were teaching 3rd grade (*n* = 12), and 15% were teaching students in multiple grades (*n* = 23). One participant did not report her current grade level assignment. The majority of these practicing teachers were teaching in an inclusive classroom; 62% reported they were in an inclusive classroom (*n* = 96), 8% reported that they spent part of their time in an inclusive classroom (*n* =13), and 30% reported they were not in an inclusive classroom (*n* =47). Similarly, 226 of all 289

participants in the study reported having spent some time working in an inclusive classroom (78%).

Of the 289 participants, 238 reported having some experience with an individual with ASD (82%). The seven categories offered on the Background Characteristics and Demographic Questionnaire were not mutually exclusive therefore several participants reported experience in several different categories (See Table 5.2 below). Since this study was conducted in New Jersey, the state with the highest proportion of individuals diagnosed with ASD, it is understandable that the reported level of experience is so high (CDC, 2014).

Table 5.2

Experience with Individuals with ASD

	Frequency	Percentage
Yes	238	82%
*Parent	12	-
Sibling	10	-
Relative/Friend	83	-
Teacher	138	-
Paraprofessional	44	-
Service Provider	36	-
Other	27	-
No	51	18%

*Categories are not mutually exclusive

The size of the participant pool for Exploratory Factor Analysis (EFA) is integral to the integrity of the results presented as well as the overall reliability of the data. Because factor analysis deals with measurement invariance (i.e., equal factor loadings

across groups), small samples can limit the statistical power needed to detect a lack of measurement invariance. Therefore, small samples sometimes mislead the researcher into thinking the factor structure is stable when it is not (Kline, 2015; Young & Pearce, 2013). When selecting a target sample size, there is not one clear rule that applies to all studies since the size of the sample depends on indicators such as the distribution of the variables, amount of missing data, reliability of the variables, and strength of relations among the variables (Muthén & Muthén, 2002). Many of these indicators are unknown when conducting an initial EFA. For purposes of this study, I used a sample size that reflected a 10:1 ratio for participants to number of items as recommended by Young and Pearce (2013). Therefore, based on the number of items in the TSE-ASDI Version 3 (i.e., 28 items) my goal was 280 participants in total. As noted above I received complete responses from 289 participants which exceeded this goal.

Measures

I collected data with a background characteristics and demographic questionnaire, the short form of the TSES (Tschannen-Moran & Woolfolk Hoy, 2001), and Version 3 of the TSE-ASDI Scale to gather the information I needed to answer the five research questions for this quantitative study.

Background characteristics and demographic questionnaire. To describe my sample of participants I requested information regarding their: age, race and gender. The questionnaire also elicited other relevant participant characteristics—teaching status (pre-service vs. in-service), special education certification, and experience with individuals with ASD. Information about these characteristics enabled me to examine the validity

evidence based on comparisons to prior research (Study 2 RQ 5). A copy of the background characteristics and demographic survey is included in Appendix J.

Teacher Sense of Efficacy Scale (TSES). I used the 12-item short form of the TSES to examine the validity evidence based on relations to other variables (Appendix K). Because the TSES is a general measure of self-efficacy for teaching I expected a positive correlation between this score and the TSE-ASDI. The TSES includes three sub-scales that assess teachers' sense of efficacy for classroom management, student engagement, and instructional practices. I used the short form of the TSES rather than the 24-item long form of this scale since previous research indicates that the long or the short form can be used with both pre-service and in-service teachers (Fives & Buehl, 2010). Responses to the TSES were provided using a 9 point Likert-type scale with anchors at 1 – nothing, 3 – very little, 5 – some influence, 7 – quite a bit, and 9 – a great deal. In Tschannen-Moran and Woolfolk Hoy's (2001) measure development article they reported reliabilities for these subscales as .90 for classroom management, .87 for student engagement, and .91 for instructional practices based on responses from pre-service and in-service teachers. I found similar reliability statistics for the data gathered in this investigation (i.e., classroom management: $\alpha = .84$; student engagement: $\alpha = .80$; instructional practices: $\alpha = .83$).

TSE-ASDI Version 3. The TSE-ASDI Version 3 scale included 28-items with five hypothesized subscales of perceived self-efficacy for teaching students with ASD in inclusive settings: (1) Develop an Understanding of Students with ASD ($n = 3$), (2) Adapt Curriculum and Instruction for Students with ASD ($n = 4$), (3) Manage Challenging

Behaviors of Students with ASD (*n* = 5), (4) Support the Social Communication of Students with ASD (*n* = 8), and (5) Collaborate with Inter-disciplinary Team Members (*n* = 8). The items were presented randomly to participants rather than grouped by subscale. The measure used a 9-point Likert-type response scale with anchoring descriptors of *cannot do at all* and *highly certain can do.* A copy of the TSE-ASDI Scale Version 3 is included in Appendix L.

Procedures

Data were collected through both on-line and paper and pencil versions of the measures described. The online platform MSUSurveys.montclair.edu (http://www.MSUSurveys.montclair.edu) powered by LimeSurvey version 2.05 was used to provide an online version of consent forms and the survey instrument to participants. Separate on-line survey instruments were designed for use with students in teacher preparation classes and for all other participants. The online survey package for students encompassed four parts. Part one was the informed consent for students, background information, and the purpose of the study (Appendix M). Part two was the Background Characteristics and Demographic Questionnaire (Appendix J). Part three was the short form of the TSES (Tschannen-Moran & Woolfolk Hoy, 2001) including directions about how to complete that measure (Appendix K). Finally, part four was the TSE-ASDI Scale Version 3 including directions about how to complete the measure (Appendix L).

The online survey package used for all other participants also encompassed four parts. Part one was the informed consent, background information and the purpose of the study (Appendix N). Part two was the Background Characteristics and Demographic

Questionnaire (Appendix J). Part three was the short form of the TSES (Tschannen-Moran & Woolfolk Hoy, 2001) including directions about how to complete that measure (Appendix K). Finally, part four was the TSE-ASDI Scale Version 3 including directions about how to complete the measure (Appendix L). This on-line survey package also directed participants to a new survey form where they could enter their email address to be included in a drawing to win one of four fifty dollar Amazon gift cards. These emails were used solely for the purposes of the drawing, and to send the winners the gift cards electronically. Upon completion of the drawing, the information in this separate survey was deleted. This sample was voluntary as teachers chose to answer the items in the survey package. This compensation was explained in the consent form used for this group of participants (Appendix N). Below I describe the processes I used to recruit participants, enter, clean, and analyze the data. Of note, participation was voluntary for all participants.

Recruitment of Participants

I recruited in-service and pre-service early childhood teachers to participate in this study. Since I needed a relatively large number of participants and the dimensions of the TSE-ASDI Scale were generated from my international review of the literature, I recruited participants in both the US and Canada.

In-person recruitment. I used convenience sampling to recruit both in-service and pre-service participants, in-person at local teacher conferences and in teacher education classes at a state University in New Jersey.

Teacher conferences. I made in-person pleas for participation in my study at the Montclair State University Network for Educational Renewal Summer Conference (June 26, 2017) and at the New Jersey Coalition for Inclusive Education Summer Conference (June 27 & 28, 2017) using the script found in Appendix O. Pre-service and in-service teachers attended both of these conferences. To promote participation I explained the contribution to the field of autism and inclusive education and offered a small incentive of a candy bar. I provided attendees who identified as early childhood teachers or teacher candidates at these conferences with the Implied Consent Form found in Appendix P along with a hard-copy of the questionnaires.

A total of 66 hard copies of the consent form and survey packet were distributed at these conferences. Packets were returned to me in person by 26 participants at the Montclair State University Network for Educational Renewal Summer Conference and by 31 participants at the New Jersey Coalition for Inclusive Education Summer Conference. Indicating a response rate of 86 percent.

University Classes. I contacted faculty members at Montclair State University who taught undergraduate and graduate level courses attended by students seeking early childhood teaching certification and/or special education certification using the e-mail found in Appendix Q. Undergraduate classes were attended by pre-service teachers seeking initial teacher certification. Both pre-service teachers seeking initial teacher certification as well as in-service certified teachers seeking an additional certification in special education attended graduate level classes. I requested the opportunity to speak in these classes and recruit students to participate in my study. I also requested that I either

give the students a hard-copy of my survey instrument to complete in class, if time allowed, or I would collect e-mails of interested students and send them an on-line version of the survey instrument

I made in-person pleas for participation in 15 classes between July 6, 2017 and January 31, 2018 using the script found in Appendix R. Faculty members in 9 classes allowed time for their students to complete my survey package at the end of their class time. Attendees in these classes were provided the Implied Consent Form found in Appendix M along with a hard-copy of the survey instrument. I collected 93 hard-copies of the consent form and survey packages from the students in these classes.

While the faculty members in the remaining 6 classes allowed me to make the in-person plea during their class time, they asked me to collect e-mails from students who were interested in participating by passing a sheet of paper around the room. I then sent these students the link to the on-line survey for students described above. Since responses were anonymous and participants who responded via this link were recruited in other ways, I do not know how many students from these classes responded to the on-line survey.

On-line recruitment. As discussed above, I collected e-mails from students in classes where I made an in-person plea but did not distribute a hard-copy of my survey instrument. I used these e-mail addresses to send these students a link to the on-line survey for students. The text of this e-mail is found in Appendix S.

I also used the letter found in Appendix Q to e-mail five faculty at universities and colleges in both the U.S. and Canada. I received replies from four of them who

agreed to share my recruitment materials with their students in teacher preparation courses. I provided the student recruitment e-mail (Appendix S) containing the link to the on-line survey for students. Due to the anonymous nature of the responses, I do not know how many on-line responses resulted from this avenue of recruitment.

I sent e-mails to both personal and professional contacts using the letter found in Appendix T. I also asked many of these contacts to forward the letter found in Appendix U on to other early childhood teachers or teacher candidates (i.e., snowball sampling). I used my personal Facebook page to recruit early childhood in-service and pre-service teachers using the social media post found in Appendix V and the social media post found in Appendix V to contact early childhood teachers across the United States via email through early childhood listservs from Teachers.net. These listservs are voluntary and are targeted at the five early childhood grade levels (e.g., pre-school, kindergarten, first grade, second grade, third grade) as a way for teachers to connect with one another across the United States. I also used the social media post found in Appendix W on the Facebook page for the Center for Autism and Early Childhood Mental Health and the Center for Pedagogy at Montclair State University and the Facebook page for Self-Reg, a professional organization in Canada with which I am affiliated.

I used the teacher recruitment letter (Appendix U) to send e-mails to all contacts on listservs for three New Jersey educational associations; the New Jersey Coalition for Inclusive Education, the New Jersey Division for Early Childhood and the Montclair State University Social Emotional Formation Initiative. I used this same letter to recruit

teachers through a national organization's listserv, the National Coalition for Campus Childcare Centers.

As mentioned above, to promote participation, at the end of the survey, teachers were directed to a new survey form where they could enter their email address to be included in a drawing to win one of four fifty dollar Amazon gift cards. These emails were used solely for the purposes of the drawing, and to send the winners the gift cards electronically. Upon completion of the drawing, the information in this separate survey was deleted. This sample was voluntary as teachers chose to answer the items in the survey package. This compensation was explained in the consent form used for this group of participants (Appendix N). A total of 91 participants entered their e-mails into the survey for the amazon gift card drawing.

Data Entry

Data were entered into one of the two on-line survey instruments described above. There were a total of 194 total entries made to the student survey. After an initial review of the hard-copy surveys completed at the conferences and in university classes to screen for participants that met my criteria, I entered 121 sets of responses by hand to the student survey (84 from all classes, 12 from the NJCIE Conference, 25 from the MSU-NER Conference). The remaining 73 responses were made directly by participants via the link to this survey. After exporting the data from the survey tool to Excel, I filtered these entries for "yes" responses to the consent by participant type. There were positive consents for 55 practicing teachers, 44 pre-service undergraduate students, and 56 pre-service graduate students.

A total of 1,871 responses registered on the general on-line survey. After exporting the data to Excel, I filtered these entries for "yes" responses to the consent by participant type. There were positive consents for 125 practicing teachers, 14 pre-service under-graduate students and 8 pre-service graduate students. I merged the 155 participants from the student survey with the 147 participants from the general survey onto one Excel spreadsheet for a total of 302 participants.

Next, I visually scanned the data to ensure that each participant met the inclusion criteria of either pre-service or in-service early childhood teacher. I then scanned the data to ensure that each participant had a unique ID code. When there were duplicate response ID's I scanned the columns for teacher status and made the following changes:

- Any participant who had responded "yes" for practicing teacher and "yes" for pre-service undergraduate student was entered only once as pre-service undergraduate student because of the criteria for teacher certification for practicing teachers. Participants may have responded this way because many non-public preschool programs do not require teacher certification for their classroom teachers.
- Any participant who had responded "yes" for practicing teacher and "yes" for pre-service graduate student was entered only once as a practicing teacher because of the number of practicing teachers with initial early childhood teacher certification seeking master's status.

Following this process, there was a total of 278 total participants and I imported this file into SPSS in early January 2018. After excluding data from four participants who

had completed the survey during my recruitment in classrooms in late January 2018, I entered 25 additional pre-service teacher sets of data directly into SPSS.

Data Cleaning

Once the data were in SPSS, I visually scanned each data set for completion of the Background Characteristics and Demographic Questionnaire, TSES and TSE-ASDI scales. Two participants were missing one item each from their Background Characteristics and Demographic Questionnaire. These participants were retained. Fourteen participants were missing more than 3 items from the TSES and/or more than 5 items from the TSE-ASDI and were deleted. I made this cut-off decision for deletion based on the three-factor structure of the TSES and the fact that I had five dimensions that guided the development of the TSE-ASDI. My final data set included 289 participants.

Data Analyses

I conducted statistical analyses in SPSS to address my research questions. Specifically, I analyzed these data using EFA, reliability analyses, correlational analyses, and by comparing mean differences as described below.

Study 2 RQ1 and RQ2: Exploratory Factor Analysis

I derived evidence for the validity of the internal structure of the TSE-ASDI Scale by examining the degree to which the items formed factors that conformed to structural expectations. Research questions one and two asked about the factor structure of the TSE-ASDI Scale and whether the factor structure differed for pre-service and in-service early childhood teachers. The main goal of a factor analysis is parsimony, summarizing

data in a simple way so that relationships and patterns can be understood. It is used to regroup variables into a limited set of factors based on shared variance (Costello & Osborne, 2005; Young & Pearce, 2013). There are two main factor analysis techniques: EFA and Confirmatory Factor Analysis (CFA). Researchers use EFA to uncover complex patterns within datasets and to test predictions, that is build theory; and use CFA to confirm hypotheses with respect to how items on a measure will function, as such test theory (Matsunaga, 2010). Given that the development of this measure and its theoretical basis are in the emergent stages, the use of EFA is most appropriate.

Exploratory factor analysis is used to estimate the unknown, latent structure of the observed data (Matsunaga, 2010). Of note, statistical scholars have commented on the ways that researchers have used the processes of exploratory factor analysis with principal components analysis interchangeably despite the fact that these two procedures while similar are conceptually and mathematically distinct (Costello & Osborne, 2005; de Winer & Dodou, 2016; Matsunaga, 2010). In contrast to EFA, principal components analysis summarizes the information from a data set and reduces it into components. Principal axis factor analysis separates the shared variance from its unique variance and error variance to uncover the underlying factor structure however principal component analysis does not differentiate shared and unique variance (Costello & Osborne, 2005). I used principal axis factor analysis rather than principal component analysis since my aim was to identify the underlying structure of the latent variables while taking into account the shared and error variance.

For the purposes of this study, I conducted an EFA on the data collected during the pilot test to provide validity evidence regarding the internal structure of the TSE-ASDI Scale. I predicted, based on my literature review, that there were five dimensions or factors for the construct teacher self-efficacy for teaching students with ASD in inclusive early childhood classrooms. A multivariate statistical analysis such as the EFA was needed to test if the score variability for each item is attributable to just one dimension or if it is also attributable to any other identified dimension (AERA, APA, NCME, 2014). I also used the EFA to make the methodological decision about how many items to retain or discard (Hayton, Allen & Scarpello, 2004).

To determine the suitability of the data for an EFA, I analyzed the Bartlett's test of Sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. Bartlett's test of Sphericity was χ^2 (378) = 7091.57, $p < .001$, and the KMO statistic was .96, well above the recommended value of .6 and suggesting "marvelous" sampling adequacy (Kaiser & Rice, 1974).

In order to determine the number of factors to extract, I used Horn's (1965) parallel analysis, a sophisticated factor extraction strategy that has greater merit than more traditional methods such as the eigenvalue greater than one rule or examination of scree plots (Thompson & Daniel, 1996). Horn's parallel analysis begins with principal axis factoring performed on randomly generated data sets. The eigenvalues of the factors that emerge from the actual data are compared to mean eigenvalues from the random data. Factors with eigenvalues greater than those of the randomly generated data are considered viable and retained for analysis (i.e., these eigenvalues exceed what would be

expected by chance). In addition to Horn's parallel analysis, I reviewed the more traditional approaches to factor identification (i.e., scree plot and eigenvalues greater than 1) to fully explore the potential of the data collected.

After determining the number of factors to extract, I conducted a principal axis factor analysis with Promax rotation and examined the rotated factor matrix for all participants. Promax is an oblique rotation, which allows the factors to relate. I anticipated that the proposed factors were at least moderately correlated since they all comprised one construct, teacher self-efficacy for teaching students with ASD in inclusive early childhood classrooms. Therefore, using oblique rotation should "theoretically render a more accurate, and perhaps, a more reproducible solution" (Costello & Osborne, 2005, p.3).

To assign items to factors, I used the following decision rules: items with pattern coefficients greater then |.40| were retained; items with pattern coefficients greater than |.40| on two or more factors were assigned to factors based on their theoretical alignment with other items on the factor and the size of the coefficients.

I conducted separate parallel analyses and EFA's on the in-service (n = 156) and pre-service (n =133) teacher responses, following the steps described above, to determine if there was a difference in the factor structure of the TSE-ASDI for these two sub-groups. I examined the emergent factor structures for each group for qualitatively different structures.

Study 2 RQ3: Reliability Analyses

Another aspect of measure development is evaluating the consistency of responses to scale items. It is typically evaluated based on the calculation of reliability coefficients that are the correlation between scores derived from replications of the testing procedure on a sample of participants (AERA, APA, & NCME, 2014). In classical test theory, three broad categories of reliability coefficients are recognized. The first are alternate form coefficients or coefficients derived from the administration of alternate forms of independent testing sessions. The second are test-retest coefficients or coefficients obtained by administration of the same form on separate occasions. The third are internal-consistency coefficients or coefficients based on the relationships/interactions among scores derived from individual items or subsets of the items within a test, with all data collected during a single administration (AERA, APA, & NCME, 2014).

Due to the single administration design of my study, the reliability of the TSE-ASDI Scale was examined using internal consistency reliability. Internal consistency implies that items within a scale are homogenous, and thus have a strong relationship to the latent construct under study (DeVellis, 2003). It is because of this that reliability of data has implications for validity. I examined the reliability of the data by calculating Cronbach's alpha for all factor solutions; the full sample and the sub-samples of pre-service and in-service teachers.

Study 2 RQ4: Correlational Analyses

After gathering validity evidence for test content and response process in my qualitative study and for the internal structure of the TSE-ASDI Scale as described above,

I continued to gather validity evidence by examining relationships to other variables (i.e., concurrent validity). My argument that the TSE-ASDI Scale measures the construct of teacher self-efficacy for teaching students with ASD in inclusive early childhood classrooms requires analyses of the relationship of this new scale to external variables such as another scale that was designed to measure the same or similar construct (AERA, APA, NCME, 2014). Therefore, I analyzed the relationship of the TSE-ASDI variable(s) to the external variables teacher self-efficacy for instructional practices, classroom management, and student engagement as assessed by the TSES (Tschannen-Moran & Woolfolk Hoy, 2001). I conducted a Pearson's *r* correlation analysis to examine the associations between the emergent factor(s) of the TSE-ASDI and the three subscales of the TSES.

Study 2 RQ5: Test Criterion Evidence

To address my fifth research question regarding previous findings in the teacher efficacy literature being replicated when teacher efficacy is assessed by the TSE-ASDI Scale, I performed a three-way ANOVA to compare mean differences between groups based on three independent variables; teacher status (pre-service and in-service teachers); special education experience (teachers and teacher candidates with special education certification or coursework and none) and experiences with ASD (experience and no experience) on the emergent factors of the TSE-ASDI Scale. Prior to conducting these analyses I examined the data for the required assumptions for ANOVA. In particular, I first ensured there were no univariate or multivariate outliers. Next I assessed the data for multivariate normality (Shapiro-Wilk Test), homogeneity of variance (Levene's test), and

multicollinearity or checking to see if the correlation of my independent variables were too low or too high. These were found to be acceptable for the first two of the independent variables, thus I refined my analyses to a 2-way ANOVA including teaching status and special education experience.

Since Levine's test for homogeneity of variance was significant for my third independent variable of interest; experience with individuals with ASD (n = 238) and none (n = 51) it did not meet the required assumptions for ANOVA. While ANOVA is considered to be relatively robust when comparison groups are of equal (or similar size; Stevens, 1993) this was not the case for these data. Therefore, this variable could not be included in a three-way ANOVA with the other independent variables of interest; teacher status and special education experience. Instead I used SPSS to randomly select 51 participants from the group of participants with experience with individuals with ASD and compared this sub-group to the 51 participants without experience with individuals with ASD using an independent t-test.

Findings

The findings below are organized by research question. Taken together there is evidence to support the use of the TSE-ASDI to assess self-efficacy for teaching children with ASD in inclusive early childhood settings.

Study 2 RQ1 and RQ2: Factor Analysis

I employed EFA, using principal axis factoring to examine the emergent factor structure of data gathered using the 28-item TSE-ASDI scale. EFAs were conducted on the whole sample and on the sub-samples of in-service and pre-service teachers. Prior

research has indicated that factor structure of self-efficacy assessments may be different based on participants' experience levels (Fives & Buehl, 2010).

Factor structure of the TSE-ASDI Scale: Full sample. Horn's (1965) parallel analysis of the data and the scree plot indicated that a one-factor solution was most appropriate for the entire sample. Therefore I conducted principal axis factoring and extracted one factor. This one factor accounted for 59.56% of the variance in the data (see Table 5.3). All items demonstrated pattern coefficients greater than |.639|. The responses to these 28-items from all participants were highly reliable, demonstrating a Cronbach's alpha of .97. These findings further support the one factor solution for the TSE-ASDI

However, when taking into account Kaiser's (1960) eigenvalue greater than one rule, a three-factor solution seemed to be potentially viable. In order to more fully explore the data I collected, I conducted a principal axis factor analysis with Promax rotation extracting three factors and examined the rotated factor matrix for all participants. I found that there were potentially three latent factors. I used the following decision rules to assign items to factors: items with pattern coefficients greater then |.40| were retained; items with pattern coefficients greater than |.40| on two or more factors were assigned to factors based on their theoretical alignment with other items on the factor and the size of the coefficients.

I labeled the emergent factors Social Communication, Instructional Support, and Collaboration and checked the reliability of each (see bottom of Table 5.3). The items assigned to each factor as well as the reliability coefficients are reported in Table 5.3.

The items that I assigned onto factor 1, named Social Communication, are related to teachers' beliefs in their ability to support the communication and social interactions of students with ASD. I named factor 2 Instructional Support. This factor includes items that are related to teachers' beliefs in their ability to adjust their teaching practices to meet the individual needs of students with ASD. Finally, the items assigned to factor 3, named Collaboration, are related to teachers' beliefs in their ability to communicate and collaborate with families of students with ASD as well as with interdisciplinary colleagues.

Factor structure for in-service teachers. Horn's (1965) parallel analysis of the data and the scree plot indicated that a one-factor solution was also most appropriate for the sample of 156 in-service teachers. The one factor accounted for 65.12% of the variance in the data and the reliability for these data with practicing teachers was .979. Similar to the full sample, three factors had eigenvalues greater than 1. Therefore, I conducted an EFA using principal axis factoring with Promax rotation extracting three factors. The emergent factors somewhat supported the three latent factors found with the full sample, but differences emerged in ways that were not theoretically meaningful.

Factor structure for pre-service teachers. For the sample of 133 pre-service teachers, Horn's (1965) parallel analysis of the data and the scree plot indicated that one factor be extracted from these data. Using principal axis factors and extracting one factor explained 53.26% of the variance. Examination of the eigenvalues indicated potential two-factor solution. I explored this solution using principal axis factoring with Promax rotation. However an examination of the item coefficients did not follow a discernable

pattern in terms of factor structure and were not similar to the factors that emerged for the whole sample or practicing teacher sample. Therefore, a single factor solution seems most appropriate for the pre-service teachers.

Single-factor solution. While three factors seemed to emerge for the whole sample and practicing teachers I recommend a single factor solution for the TSE-ASDI for the following reasons. First, Horn's (1965) analysis is a more sophisticated factor extraction strategy and has more merit than the more traditional Kaiser-Guttman rule of eigenvalues greater than one (Thompson & Daniel, 1996). For these data the parallel analysis supported the one factor solution. Second, the single factor solution generated a more parsimonious scale. The main goal of a factor analysis is parsimony, summarizing data in a simple way so that relationships and patterns can be understood (Costello & Osborne, 2005; Young & Pearce, 2013). Third, the single factor allowed for use of the same TSE-ASDI Scale with both pre-service and in-service teachers, which can allow for comparisons across these groups. Fourth, the ASSET, which is the existing teacher self-efficacy instrument measuring the most similar construct to the TSE-ASDI, has only one factor (Ruble et al., 2013). Thus, based on the analysis of the data gathered in this investigation it seems that the one factor solution is most appropriate.

Table 5.3:

Item Assignment and Pattern Matrix for the 1 and 3 Factor Solutions

	Factor Matrix[a]	**Pattern Matrix[b]**		
	1 Factor	3 Factor		
Items from the TSE-ASDI	1	1	2	3
25. Support this student's ability to consider another person's perspective that differs from his or hers	**.755**	**1.09 9**	-.234	-.051
27. Facilitate this student's ability to communicate his or her ideas to classmates	**.809**	**.911**	-.020	-.024
24. Help this child's ability to understand what classmates are communicating to him or her	**.847**	**.837**	.045	.029
26. Teach this student strategies to calm him or herself	**.813**	**.781**	-.056	.164
13. Help classmates to understand what this child is communicating to them	**.764**	**.657**	.086	.081
11. Support the participation of this student in unstructured social activities (e.g., engaging with peers during lunch, recess, or free-play)	**.774**	**.604**	.216	.007
19. Help this child understand what familiar adults are communicating to him or her	**.837**	**.589**	.224	.087
17. Reduce this student's challenging behaviors in your classroom	**.795**	**.479**	.428	-.069
10. Facilitate this student's ability to communicate his or her ideas to familiar adults	**.743**	**.458**	.239	.104
23. Plan curricular activities (i.e., math lesson, science group project) to allow this student to actively participate	**.807**	**.441**	.404	.013
16. Support the participation of this student in structured social activities (e.g., rule-based games)	**.805**	.386	.211	.289
3. Recognize this student's strengths (e.g., memorization, abstract reasoning, fine motor, gross motor, music, art)	**.763**	-.043	**.852**	.000
1. Arrange the classroom environment to help this student be more independent (i.e., provide picture sequences of a routine task)	**.660**	-.095	**.849**	-.061
2. Coach paraprofessionals/educational or teaching assistants in their assigned tasks for working with this student	**.704**	-.027	**.791**	-.021

	Factor Matrix[a]	Pattern Matrix[b]		
	1 Factor	3 Factor		
Items from the TSE-ASDI	1	1	2	3
21. Recognize things that this student finds challenging or upsetting (e.g., loud noises, handwriting, expressive communication, comprehension of language or text, changes in routines or schedules, the emotions of another person)	**.745**	.213	**.624**	-.053
4. Delegate explicit tasks to the paraprofessional/educational or teaching assistant working with this student	**.749**	.016	**.619**	.177
20. Provide multiple ways for this student to express his or her answers or ideas during a lesson or activity (e.g., pointing to pictures or picture symbols, speaking, typing)	**.788**	.124	**.615**	.107
22. Incorporate strategies provided by others who know this student well (e.g., speech & language therapist, occupational therapist, another teacher, parents, caregivers) into your accommodations and motivations	**.786**	.005	**.550**	.310
14. Modify how lessons are presented to allow this student to understand the content (e.g., provide visuals, reduce language)	**.831**	.308	**.533**	.045
12. Identify why this student might be exhibiting a challenging behavior (e.g., overwhelmed by too many sensory stimuli, challenged by motor demands, frustrated by inability to communicate, anxious because of changes in routines or schedules, upset by the emotions of another person)	**.809**	.463	**.531**	-.148
18. Make changes to your teaching and/or the classroom environment to reduce challenges for this student	**.829**	.356	**.505**	.021
9. Understand what interests this student	**.750**	.247	**.491**	.063
6. Remain calm yourself so that you can help calm this student when necessary	**.660**	.078	.391	.257
5. Establish a system of two-way communication with this student's family	**.653**	.039	-.145	**.904**
15. Seek information from the family that will contribute to your understanding of this student's strengths and challenges	**.686**	.104	-.094	**.810**
8. Explain the challenges you are having with this student to an inter-disciplinary colleague (e.g., speech & language therapist, occupational therapist, another teacher) in	**.639**	-.208	.366	**.582**

Items from the TSE-ASDI	Factor Matrix[a] 1 Factor 1	Pattern Matrix[b] 3 Factor 1	2	3
order to seek strategies and interventions to use in your classroom				
28. Explain your reasons for using particular strategies or interventions with this student to his or her family	**.746**	.174	.214	**.452**
7. Plan lessons cooperatively with inter-disciplinary colleagues (e.g., speech & language therapist, occupational therapist, another teacher) who are working with this student	**.734**	.066	.325	**.432**
Eigenvalue	16.677	16.677	1.352	1.046
Variance Explained	59.56	59.56	4.83	3.74
Cronbach's Alpha	.974	.954	.944	.874

[a]Extraction Method: Principal Axis Factoring.
[b]Extraction Method: Principal Axis Factoring, Rotation Method: Promax with Kaiser Normalization, Rotation converged in 7 iterations

Item reduction. Length of scales is always of concern and given the decision to use a single-factor solution I wanted to reduce the number of items on the scale. Most scales or questionnaires regarding teachers' beliefs measure between one and four distinct dimensions and typically use 6 to 12 items to assess each separate dimension (Shraw & Olafson, 2015). In addition, the number of items on a scale can be used to inflate the reliability statistic when calculating Cronbach's alpha therefore reducing the number of items on the scale can also prevent such methodological bias (e.g., Cortina, 1993). Finally, during my expert review in Phase One, I received suggestions to reduce the length of the scale due to the cognitive burden placed on participants by having to read too many items.

I used the three-factor solution from the whole sample and the reliability coefficients for the three latent factors, Social Communication, Instructional Support, and Collaboration to facilitate my decision-making regarding the deletion of 12 items from the 28-item Version 3 of the TSE-ASDI Scale. My target was to retain five items from each of these factors so that the scale would retain its diverse nature. Items 6 and 16 were dropped because they did not have pattern coefficients greater than |.40| on any factor. I reviewed each item in the Instructional Support and Social Communication factors and used the following decision rules to delete items: items with pattern coefficients less then |.50| (i.e., 9, 10, 17, 23), items that were double-barreled (i.e, 18), and items that duplicated other items on the scale that had higher loadings (i.e., 4, 9, 12, 13, 19, 22). There were only five items that were assigned to factor three, the Collaboration factor, therefore I kept all five of these items, despite the decision rules described above. This resulted in a 16-items scale. The means and standard deviations for each of the groups are provided in Table 5.4.

Table 5.4:

Descriptive statistics for the 16-item TSE-ASDI Scale

Teaching Status	Mean	Std. Deviation	N
All participants	7.45	1.22	289
In-service teachers	7.51	1.31	156
Pre-service teachers	7.39	1.10	133

Study 2 RQ3: Reliability Analyses

In order to ascertain the internal reliability of the 16-item TSE-ASDI, I calculated the Cronbach's alpha which is useful for estimating reliability "when item-specific

variance in a unidimensional test is of interest" (Cortina, 1993, p. 103), which was the goal in this investigation. Specifically, a large alpha in the context of a single factor (unidimensional test) scale indicates that most of the variance in the measure can be attributed to general and group factors rather than item-specific variance. That is, responses to the scale explain the underlying or latent construct, high alphas indicate that the items on a unidimensional scale are assessing the same thing. The 16-item TSE-ASDI Scale yielded sound reliability scores for the full sample (α = .952), for in-service teachers (α =.961), and for pre-service teachers (α =.939).

Study 2 RQ4: Correlational Analyses

I examined the association between responses to the new 16-tem TSE-ASDI 16-Scale and the subscales of the TSES: Classroom Management (CM), Instructional Practice (IP), and Student Engagement (SE). Moderate significant correlations emerged among the TSE-ASDI and the three measures of teachers' sense of efficacy by conducting a Pearson's *r* analysis as demonstrated in Table 5.5. Specifically, the TSE-ASDI demonstrated a correlation of .471 with self-efficacy for classroom management, .576 with self-efficacy for instructional practices, and .442 with self-efficacy for student engagement. These moderate correlations demonstrate that while these instruments are related they are not measuring identical constructs.

Table 5.5:

Correlations among TSE-ASDI and TSES dimensions of teacher self-efficacy

Measure	TSE-ASDI	TSES: Classroom Management	TSES: Instructional Practices	TSES: Student Engagement
TSE-ASDI	1	.471**	.576**	.442**
TSES: Classroom Management	.471**	1	.650**	.675**
TSES: Instructional Practices	.576**	.650**	1	.630**
TSES: Student Engagement	.442**	.675**	.630**	1

** Correlation is significant at the 0.01 level (2-tailed).

Study 2 RQ5: Test Criterion Evidence

In order to determine if responses to the new 16-item TSE-ASDI Scale followed patterns that emerged in other investigations of teachers' sense of efficacy, I compared mean scores for subgroups of interest in my sample based on teaching status (pre-service/in-service), experiences with special needs (TSD Cert/No TSD Cert), and experience with a child with ASD (ASD Experience/No ASD Experience).

As noted in the data analysis section the third group did not meet the assumption for homogeneity of variance, therefore I conducted a 2-way ANOVA for the first two independent factors and a t-test for the third. I describe the findings and statistics for each in the paragraphs that follow.

Nine practicing teachers and 3 pre-service teachers did not indicate a certification of any kind, therefore for these analyses I included data from the 147 practicing and 130 pre-service teachers who indicated their certification status. The means and standard deviations for these groups are provided in Table 5.6. The 2-way ANOVA yielded a significant main effect of special education certification, on participants self-efficacy for working with children with autism in inclusive early childhood classrooms, $F(1, 273) = 4.562$, $p = .034$; $eta^2 = .016$. This effect indicated that teachers with a TSD certification or teacher candidates working towards a TSD certification had higher self-efficacy for teaching students with ASD inclusive settings than teachers or teacher candidates who did not have this specialized teacher preparation. There was no main effect for teaching status, $F(1, 273) = 1.831$, $p = .177$; $eta^2 = .007$ nor was there a significant interaction effect $F(1, 273) = .138$, $p = .711$; $eta^2 = .001$.

There was a significant difference in the scores of the randomly selected 51 participants from the sub-group of participants with experience with ASD (M = 7.61, SD = 1.32) and the 51 participants without experience with an individual with ASD (M = 6.80, SD = 1.46); $t(100) = 2.915$, $p = .004$. Thus, individuals with experience with ASD had stronger self-efficacy for teaching these students in inclusive settings than individuals who did not have this experience.

Table 5.6:

Descriptive Statistics for Teaching Status and Special Education Experience

Teaching Status	TSD Status	Mean	Standard Deviation	N
In-service	TSD Cert	7.71	1.17	70
	No TSD Cert	7.33	1.43	77
	Total	7.51	1.32	147
Pre-service	TSD Cert	7.45	1.07	86
	No TSD Cert	7.18	1.15	44
	Total	7.36	1.10	130
Total	TSD Cert	7.5683	1.12053	156
	No TSD Cert	7.2791	1.33322	121
	Total	7.4420	1.22417	277

Limitations

As with any investigation, this study had limitations. The sample was a non-random, convenience sample, in which teachers were predominantly recruited from one state, New Jersey, and teacher candidates from one university, Montclair State University. Therefore, the results are not representative of the larger U.S. or global teaching or teacher education population. In addition, my recruitment procedures included appealing to teachers attending an inclusive education conference as well as teacher candidates enrolled in teacher preparation programs with a strong emphasis on inclusion. Thus, the sample of teachers who participated in this investigation may be

unique in their exposure to professional development and coursework related to inclusive education.

Another limitation is that this study did not explore the individual profile or severity of ASD symptoms of the children that each participant kept in mind while completing the scale. The heterogeneity of the population of children with the diagnosis of ASD may have influenced participants' responses. Finally, the use of an EFA is a limitation of this study as this is an error-prone procedure even with an optimal data set and large samples (Costello & Osborne, 2005).

Discussion

I gathered evidence for validity based on the internal structure of the TSE-ASDI Scale by exploring the factor structure of practicing and pre-service early childhood teachers' responses. While I originally proposed a five factor structure based on my literature review and identification of the Autism Inclusion Tasks, my investigation suggests that efficacy beliefs for both pre-service and in-service teachers are not differentiated on tasks related to the construct of teaching students diagnosed with ASD in inclusive early childhood classrooms. Instead, a one-factor solution emerged for the entire sample as well as the sub-groups of pre-service and in-service teachers.

In the final 16-item TSE-ASDI Scale, items describing tasks similar to or the same as items in Version 2 of the TSE-ASDI Scale from each of the five original factors were retained (See Table 5.7). While a one-factor solution is suggested for the TSE-ASDI Scale, this distribution of items indicates that the original dimensions that guided the development of this scale are still represented. I also explored how the 3-factor emergent

structure discussed in the findings section; Instructional Support, Social Communication, and Collaboration, aligned with the original five dimensions. Looking at these data I saw that assessment, adapting curriculum, and recognizing challenges (another form of assessment) while distinct in the literature all fall together as instructional supports. Similarly, all of the social communication support items fall together with the addition of teaching a child to calm his/herself, which was seen as classroom management originally, but it is reasonable to be placed with social communication support as that this is needed for a child to engage in social communication with others.

Table 5.7:

Crosswalk between TSE-ASDI Items, Autism Inclusion Tasks, and Emergent Factors

Autism Inclusion Tasks	TSE-ASDI Scale (16 items)	Emergent Factors*
Develop an understanding of students with ASD	3. (3V2) Recognize this student's strengths (e.g., memorization, abstract reasoning, fine motor, gross motor, music, art)?	IS
Adapt curriculum and instruction for students with ASD	1. (1V2) Arrange the classroom environment to help this student to be more independent (i.e., provide picture sequences of a routine task)?	IS
	8. (14V2) Modify how lessons are presented to allow this student to understand the content (e.g., provide visuals, reduce language)?	IS
	10. (20V2) Provide multiple ways for this student to express his or her answers or ideas during a lesson or activity (e.g., pointing to pictures or picture symbols, speaking, typing)?	IS
Manage challenging behaviors of students with ASD	11. (21V2) Recognize things that this student finds challenging or upsetting (e.g., loud noises, handwriting, expressive communication, comprehension of language or text, changes in routines or schedules, the emotions of another person)?	IS

Autism Inclusion Tasks	TSE-ASDI Scale (16 items)	Emergent Factors*
	14. (26V2) Teach this student strategies to calm him or herself?	SC
Support the social communication of students with ASD	7. (11V2) Support the participation of this student in unstructured social activities (e.g., engaging with peers during lunch, recess, or free-play)?	SC
	12. (24V2) Help this child's ability to understand what classmates are communicating to him or her?	SC
	13. (25V2) Support this student's ability to consider another person's perspective that differs from his or hers?	SC
	15. (27V2) Facilitate this student's ability to communicate his or her ideas to classmates?	SC
Collaborate with interdisciplinary team members including families	2. (2V2) Coach paraprofessionals/educational or teaching assistants in their assigned tasks for working with this student?	IS
	4. (5V2) Establish a system of two-way communication with this student's family?	C
	5. (7V2) Plan lessons cooperatively with inter-disciplinary colleagues (e.g., speech & language therapist, occupational therapist, another teacher) who are working with this student?	C
	6. (8V2) Explain the challenges you are having with this student to an inter-disciplinary colleague (e.g., speech & language therapist, occupational therapist, another teacher) in order to seek strategies and interventions to use in your classroom?	C
	9. (15V2) Seek information from the family that will contribute to your understanding of this student's strengths and challenges?	C

Autism Inclusion Tasks	TSE-ASDI Scale (16 items)	Emergent Factors*
	16. (28V2) Explain your reasons for using particular strategies or interventions with this student to his or her family?	C

*Code: Instructional Support (IS); Social Communication (SC); Collaboration (C)

Finally, all of the collaboration items fall together with the exception of coaching a paraprofessional or teaching assistant in their assigned tasks for working with a child, which fell more with instructional support. This is reasonable since this specific collaborative relationship may be viewed as the teacher helping the paraprofessional to support the child's access to instruction.

The one-factor structure of the TSE-ASDI Scale differs from the findings of Tschannen-Moran and Woolfolk Hoy (2001) who found differences in factor structure on the TSES between pre-service and in-service teachers for the more general construct of teaching. Fives and Buehl (2010) found similar results in a study of in-service (n = 102) and pre-service teachers (n = 270) using both the long and short forms of the TSES.

My finding of one dominant factor for the TSE-ASDI Scale is, however, similar to the one-factor structure of the ASSET (Ruble et al., 2013). The ASSET, discussed in detail in Chapter 2, is intended to assess the beliefs of special education teachers about their ability to carry out professional tasks associated with teaching students with ASD in both self-contained special education and general education classrooms.

This 16-item TSE-ASDI Scale was highly reliable with the overall sample (α = .952) as well as the two sub-groups of in-service (α = .961) and pre-service teachers (α =

.939). Nunnally (1978) argued that the minimally acceptable reliability score depends on the purpose of the scale in the context of its use. In early stages of research a .700 might be acceptable, in the context of basic research he suggested a minimum alpha of .800, and in applied settings where the score itself matters, he felt that a minimum of .900 was warranted. The data generated from the 16-item version of the TSE-ASDI meets the most stringent of these guidelines. This, supports the use of the TSE-ASDI in multiple research and applied contexts.

I also gathered evidence for validity based on the relationship of the TSE-ASDI to an existing measure of a similar construct. The TSE-ASDI Scale was moderately correlated with the TSES (Tschannen-Moran & Woolfolk Hoy, 2001) indicating that it measures a similar yet distinctively different construct. My claim that the TSE-ASDI Scale measures the construct of teacher self-efficacy is supported by this analyses of the relationship of the TSE-ASDI to external variables such as the sub-scales of the TSES that were designed to measure a similar construct (AERA, APA, NCME, 2014). The moderate level of the correlation was expected since the unlike the TSES, the TSE-ASDI Scale is measuring teacher self-efficacy in a specific context (i.e., inclusive early childhood classrooms) and for specific tasks (i.e., Autism Inclusion Tasks).

Additionally, I gathered evidence for validity by comparing mean scores for subgroups of interest in my sample based on teaching status (pre-service/in-service), experiences with special needs (TSD Cert/No TSD Cert), and experience with a child with ASD (ASD Experience/No ASD Experience) to see if they followed patterns that emerged in previous investigations of teachers' sense of efficacy.

Previous studies comparing pre-service and in-service teachers' self-efficacy have yielded mixed results. Brousseau, Book, and Byers (1988) found that pre-service teachers demonstrated higher levels of efficacy that declined with experience. Gorrell and Dharmadasa (1994) found that pre-service teachers reported higher efficacy for implementing new methods of instruction while in-service teachers reported higher efficacy for classroom management, organization of instruction, and impact on students. Campbell (1996) found that in-service teachers in the United States and Scotland reported significantly higher efficacy beliefs than did pre-service teachers. My analyses suggest that the self-efficacy for teaching students with ASD in inclusive early childhood classrooms is not different for pre-service and in-service teachers. This lack of difference may be due to a lack of specialized knowledge.

Presence of special education certification is an important variable to investigate because previous research shows that teachers with specific preparation in special education have higher self-efficacy for inclusive teaching (Sokol & Sharma, 2013) and higher self-efficacy for teaching students with the diagnosis of ASD (Barned et al., 2011, Humphrey & Symes, 2013; Stoiber et al., 1998). Sokol and Sharma (2013) examined the efficacy for inclusive teaching of 131 in-service Kindergarten to grade 8 teachers in Canada using the Teacher Efficacy for Inclusive Practices Scale (Sharma et al., 2012). Their findings suggest that general education teachers who had obtained some form of training in special education were likely to feel more positive and confident about teaching students with disabilities in their classrooms.

With regard to previous research related to self-efficacy for teaching students with a diagnosis of ASD, special education teachers felt more competent (Stoiber et al., 1998) and expressed higher self-efficacy (Humprhey & Symes, 2013) relative to general education teachers. Barned et al. (2011) found that the pre-service early childhood general education teachers in their U.S. based study held serious reservations about their ability to teach children with ASD and thought that special educators, who they believed to be better prepared for the task, would perform better in that role. My analyses led to similar findings since both pre-service and in-service teachers with special education preparation had statistically significantly higher mean scores on the TSE-ASDI Scale than their counterparts without this specialized preparation.

Finally, the variable experience with children with ASD (i.e., parent of, sibling of, other relative/friend, teacher of student with ASD, paraprofessional for student with ASD, service provider to individual with ASD outside of school) is an important variable as research indicates that those with prior interaction with individuals with disabilities have higher self-efficacy for inclusive teaching (Ahsan, Sharma, & Deppeler, 2012; Carroll, Forlin, & Jobling, 2003; Loreman, Sharma & Forlin, 2013; Sharma, Shaukat, & Furlonger, 2015). In a study with 220 pre-service teachers in Australia, Carroll et al. (2003) found that people with increased contact with individuals with disabilities demonstrated higher levels of comfort with and greater certainty about interacting with this population. Again, my analyses led to similar findings since participants with experience with individuals with ASD had statically significantly higher mean scores on the TSE-ASDI Scale than their counterparts without this experience.

Conclusion

In this chapter I described how I conducted a pilot study to investigate the validity and reliability of the instrument I developed, the TSE-ASDI Scale, to measure the construct of teacher self-efficacy to teach students with the diagnosis of ASD in inclusive early childhood classrooms. Through this process I gathered evidence for validity based on test content, response process, internal structure of the instrument as well as evidence based on relations to other variables. I also revised Version 3 of this scale, used during the pilot study, by deleting 12 items and recommending a one-factor structure for use with both practicing and pre-service teachers. The new 16-item TSE-ASDI Scale is a highly reliable measure for researchers to use in broadening our understanding of the construct of self-efficacy and the role these beliefs may play in teachers' experiences in working with children with ASD. In Chapter 6 I discuss implication for both research and practice as well as make recommendations for future research.

CHAPTER SIX: CONCLUSIONS, IMPLICATIONS, AND FUTURE RESEARCH

I developed and validated a teacher self-efficacy instrument to measure teachers' self-efficacy for teaching students diagnosed with ASD in inclusive early childhood classrooms, the *Teacher Self-efficacy for Teaching Students with ASD in Inclusive Classrooms Scale*: TSE-ASDI, for use with both pre-service and in-service teachers. This chapter reviews the need for such an instrument, a summary of the findings, offers implications for research and practice, and suggests recommendations for future research.

Need for the TSE-ASDI Scale

As the number of students diagnosed with ASD increases and research demonstrates the benefits of an inclusive education for these students, teachers need preparation and professional development to feel confident in carrying out the task of teaching students with ASD in classrooms with their typically developing peers. Teacher educators and researchers need an instrument specifically designed to measure this construct.

The Diagnosis of ASD and the Move to Inclusive Education

The number of children diagnosed with ASD in the United States has reached sizeable proportions with the most recent numbers indicating one out of every 68 children has this diagnosis (Christensen et al., 2016). As these numbers increase so do the numbers of children eligible for special education services in schools under the classification of Autistic. Research findings support both the social and academic benefits of inclusive educational environments for students with the diagnosis of ASD, however, general education teachers find students with ASD challenging to teach and feel ill-

prepared to teach these students (Humphrey & Symes, 2013; Lindsay, Proulx, Scott, & Thomson, 2013). As discussed in detail in Chapter 2, the practice of recommending and supporting inclusive educational placements for those students deemed challenging is related to teachers' beliefs in their ability or their self-efficacy to teach these students in general education settings (Soodak & Podell, 1994; Soodak, Podell & Lehman, 1998).

Difficulties with Current Measures

Bandura (1977) described self-efficacy beliefs as domain, context, and task-specific. The ability of self-efficacy beliefs measures to predict future behavior and performance is dependent on whether the instrument assesses one's judgment of his or her capability to perform a specific realm of activity (domain) within a particular situation (context), and carry out clearly defined activities (tasks). In accordance with Bandura's theory, an instrument to measure this construct needs to clearly define the domain as teaching students with ASD, the context as inclusive early childhood classrooms, and the tasks as those activities that teachers believe they need to do to teach these students in this context.

I identified five Autism Inclusion Tasks through my review of the literature on teachers' beliefs about working with students with ASD, the diagnosis literature, and interdisciplinary research on ASD. These tasks, refined based on feedback from my expert panel, included (1) developing an understanding of students with ASD, (2) adapting curriculum and instruction for students with ASD, (3) managing challenging behaviors of students with ASD, (4) supporting the social communication of students with ASD, and (5) collaborating with interdisciplinary team members including families.

Currently, an instrument to measure the construct of teacher self-efficacy to teach students with ASD in inclusive early childhood classrooms does not exist. The six studies on teacher self-efficacy for teaching students with a diagnosis of ASD conducted at the time of this writing did not examine self-efficacy for teaching in the context of inclusive general education classrooms with a focus on the tasks teachers believe to be important for working with children with ASD. As stated above, in this study I developed and validated such a measure.

Summary of Findings

This investigation involved three phases to develop the TSE-ASDI. During the First Phase of my research I gathered evidence for test content by conducting an extensive literature review on teacher self-efficacy beliefs about teaching students with ASD and current teacher self-efficacy research related to teaching students with ASD. I developed an initial draft of the TSE-ASDI Scale and had experts in the fields of teacher self-efficacy, autism, and inclusive education review it. I refined the scale based on this feedback creating the TSE-ASDI version 2.

I used the second version of the TSE-ASDI Scale in Phase Two, Study One of this investigation. In Study One, I employed qualitative methods to gather evidence for validity of the TSE-ASDI Scale based on test content and response process. Cognitive pre-testing of four pre-service and four in-service early childhood teachers allowed me to explore how participants from the target populations for the TSE-ASDI Scale interpreted the directions and items in relation to the intended meaning.

Participants' responses during the cognitive pre-testing interviews indicated that I needed to provide clarity in the directions regarding the inclusive nature of the context in my wording of the directions (Version 2). I added the phrase "in inclusive classrooms" to the directions as my goal with the TSE-ASDI is to measure the construct of teacher self-efficacy for teaching students diagnosed with ASD in *inclusive* classrooms. Participants' responses indicated that several items were interpreted as being repetitive or describing similar tasks. Therefore, I combined two items and deleted two items. Participants' responses also indicated that the wording of thirteen items was unclear or did not convey my intended meaning. Based on the recommendations of participants I combined three items and reworded eleven items. Finally, participants indicated that examples for two items did not clearly convey experiences they would have in early childhood classrooms. Therefore, I revised the examples for these two items. The result was four fewer items in Version 3 of the TSE-ASDI Scale for a total of 28 items.

During Phase Three, Study Two, I used a Background Characteristics and Demographic Questionnaire, the TSES (Tschannen-Moran & Woolfolk Hoy, 2001), and Version 3 of the TSE-ASDI Scale to conduct a pilot study with 289 participants; 156 in-service and 133 pre-service early childhood teachers. As part of this quantitative investigation I gathered evidence for validity based on the internal structure of the scale by conducting an EFA on data gathered from my participants. My interpretation of the EFA results led to my determination that teachers' (pre-service and in-service) self-efficacy beliefs for teaching children with ASD in inclusive setting are not differentiated with respect to the tasks identified in relation to teaching students diagnosed with ASD in

inclusive early childhood classrooms since a one-factor solution emerged. My analyses allowed me to delete 12 items and create a 16-item TSE-ASDI Scale. This scale was highly reliable with the overall sample as well as the two sub-groups of pre-service and in-service teachers.

I also gathered evidence for validity based on relations to another teacher self-efficacy measure. The TSE-ASDI Scale was moderately correlated with the TSES (Tschannen-Moran & Woolfolk Hoy, 2001) indicating that it measures a related yet unique construct. Finally, I gathered evidence for validity based on test criterion evidence. Findings from my study followed patterns that emerged in other investigations of teachers' sense of efficacy. Specifically, teachers and teacher candidates with special education preparation had higher mean scores on the TSE-ASDI Scale than their counterparts without this specialized education. My findings also demonstrated participants with experience with individuals with ASD had higher mean scores on the TSE-ASDI Scale than participants without this experience. Moreover these findings are expected as individuals holding greater experience in special education and with individuals with ASD should feel more confident in their ability to meet the needs of these learners.

In summary, my measure development process provided evidence for validity based on test content, response process, internal structure of the instrument as well as evidence based on relations to other variables. The result of this process was a highly reliable, 16-item scale to measure the construct of teaching students with ASD in

inclusive early childhood classrooms. Based on these findings, this investigation has implications for research and practice.

Implications for Research

This study makes a salient contribution to the field of teacher preparation and teacher development, by providing a reliable and short scale for researchers to use in broadening our understanding of the construct of self-efficacy and the role these beliefs may play in teachers' experiences in working with children with ASD. This investigation also provides a study design that can service as a guide for others seeking to develop a scale to assess attitudes, beliefs or opinions.

Teacher Preparation and Teacher Development

This TSE-ASDI Scale is intended for broad use by teacher educators and educational researchers to make valid inferences and evaluations about teachers' self-efficacy to carry out identified tasks with students diagnosed with ASD in inclusive educational settings. Since the 16-item TSE-ASDI Scale yielded reliability scores above .90 for the full sample ($\alpha = .95$), for in-service teachers ($\alpha = .96$), and for pre-service teachers ($\alpha = .94$) it meets the most stringent guidelines for the use of a scale and therefore is appropriate for use in multiple research and applied contexts (Nunnally, 1978).

Teacher educators and those who provide professional development to in-service teachers might use this scale to examine the influence of their course content or learning experiences on teacher self-efficacy for teaching students with ASD in inclusive early childhood classrooms. Similarly, teacher educators as well as district administrators may

want to use the TSE-ASDI Scale to study the influence of experience working with a student with ASD during student teaching or as a paraprofessional on teacher self-efficacy for teaching students with ASD in inclusive early childhood classrooms.

The development of this scale began with an extensive literature review that yielded five areas of teaching tasks described by teachers and ASD experts as necessary for meeting the needs of children with ASD in inclusive settings. Future research should examine the extent to which the development of teachers' knowledge and skills with respect to these tasks yields better outcomes for both teacher and students with ASD. The TSE-ASDI could be used as one means of assessing such outcomes.

Study Design

Similar to Gehlbach and Brinkworth (2011), I adopted a process that balanced the use of qualitative and quantitative research techniques. The process I used was inherently collaborative in that it relied on comments and suggestions made by experts in the field as well as potential participants to frontload the process of gathering validity evidence based on test content and response process. Focusing on validity as I developed items allowed me to run a more efficient pilot study and ultimately generate a more parsimonious scale.

I identified five tasks that general education teachers considered essential to successfully teaching these students in general education classrooms during my review of the empirical research on teachers' beliefs about teaching students diagnosed with ASD. Also during my literature review, I found these five tasks to be supported by the diagnosis literature and interdisciplinary research on ASD as well as the experts that

reviewed the first version of my scale. These Autism Inclusion Tasks comprised the five dimensions that guided my development of items for the TSE-ASDI Scale.

While these five dimensions did not reveal themselves as differentiated factors in the EFA, this process did help me generate qualitatively sound items. Future scale developers may want to follow the research design I followed here (See Figure 3.1 in Chapter 3) to explore the validity of their scale and limit qualitative issues with items before conducting an exploratory analyses.

Implication for Practice

My study found that teachers' self-efficacy beliefs for teaching students diagnosed with ASD in early childhood classrooms are not differentiated. Based on my investigation, these beliefs are less differentiated for pre-service teachers than for in-service teachers whose responses to the TSE-ASDI Scale showed some evidence of distinct efficacy beliefs to support the social communication and interactions of students with ASD, to adjust their teaching practices to meet the individual needs of students with ASD, and to communicate and collaborate with families of students with ASD as well as with interdisciplinary colleagues.

Unidimensional View of the Task

Similar to Ruble and colleagues (2013) who found that special education teachers viewed teaching students with ASD as a unidimensional task based on their responses to the ASSET, teachers in this study, especially pre-service teachers, seem to view teaching students with ASD in inclusive early childhood classrooms as a more unidimensional phenomenon than a highly complex task. This may be related to the fact that ASD has

historically been socially constructed as a diagnosis that warrants specialized interventions and segregated education.

To date, ASD has been framed as a disease (Murray, 2012). This framing is evident in the Combating Autism Act (CAA) of 2006 that authorized one billion dollars in funding to combat autism through research, screening, early detection and early intervention. While the most recent reauthorization of this act (The Autism Collaboration, Accountability, Research, Education and Support Act, 2014) softened the language of the original bill, individuals in the United States—including teachers—have been exposed for a decade to media messages that frame the availability of funding for research as a means of supporting the "war on the *epidemic of autism*" (Autism Speaks, 2006). Indeed, autism research has increased the instances of children being subjected to batteries of diagnostic tests with the goal of describing the phenomena "objectively" (Goodley, 2011). This is generally taken to mean measuring the "abnormal" and "unusual" behaviors listed in the diagnostic criteria for ASD (DSM-V, 2013), and employing very rigid interventions to eliminate these behaviors. This framing of ASD may have lead teachers to view teaching students with this diagnosis as a unidimensional task focused on normalizing behavior.

Need for Specialized Coursework

I found, similar to previous research, that teachers and teacher candidates with special education preparation had higher self-efficacy for teaching students with ASD in inclusive classrooms than their counterparts without this specialized coursework. In consideration of this with the unidimensional perspective that emerged indicates that

coursework that supports teachers' awareness of the heterogeneity of the students with this diagnosis is important.

As discussed in detail in Chapter 2, the diagnosis of ASD covers a very large spectrum of individual differences. Unfortunately, psychologists and psychiatrists have the same diagnostic label of ASD to describe individuals with a broad range of challenges including three levels of severity (APA, 2013). This label of ASD often proceeds students into the classroom. The specifics of each child's individual strengths and challenges are not all captured by the diagnostic label. As a result, teachers need to develop their own understanding of the individual needs of each child with this diagnosis and be aware of the heterogeneity of the individual profiles of children with ASD with regard to language development, cognitive abilities and sensory processing.

The heterogeneity of the diagnosis of ASD is supported by the interdisciplinary research literature. This research needs to be part of teacher preparation coursework on ASD. For instance, while all children given the diagnosis of ASD have social communication challenges, their language profiles are very heterogeneous (Kjelgaard & Tager-Flusberg, 2001; Tager-Flusberg, 2006). One child may be non-verbal and another child of the same age with this diagnosis may speak in full sentences. As a result, the teacher must approach teaching these two children differently. Similarly, research supports the heterogeneity of the sensory processing of those diagnosed with ASD (McIntosh, Miller, & Shyu, 1999; Tomchek & Dunn, 2007). Also, the cognitive abilities of children with the diagnosis of ASD are diverse require individualized support (Christensen et al., 2016). Because children may have the same diagnosis of ASD but

display vastly different communication, sensory and cognitive profiles, understanding the individual needs of each student with ASD is an essential task for teaching these students in general education classrooms.

The development of the TSE-ASDI Scale began with an extensive literature review that yielded five areas of teaching tasks described by teachers and ASD experts as necessary for meeting the needs of children with ASD in inclusive settings. These tasks can serve as a framework for the design and development of learning experiences for pre-service and practicing teachers who will be working with this population of learners. Likewise the TSE-ASDI Scale could potentially be used in practice settings to guide reflection and help practitioners to recognize their own areas of needed development.

Recommendations for Future Research

My study focused on the development and validation of the TSE-ASDI Scale and leads to future research to confirm these findings. My analysis of the EFA results used during the pilot study, indicated a one-factor solution was most appropriate for the entire sample. However, both Kaiser's (1960) eigenvalue greater than one rule and a principal axis factor analysis with Promax rotation extracting three factors suggested a latent three-factor structure for the entire sample as well as the in-service sample. Since the first stage of factor analysis has already been conducted, future studies should use the second stage of factor analysis (i.e., CFA) to test the potential dimensionality of the instrument for both pre-service and in-service teachers.

Another possible area of future research is to explore if teachers' self-efficacy for teaching students with ASD in inclusive early childhood classrooms is dependent on the

severity of the students' ASD characteristics. Previous research found that teachers held more negative views about the inclusion of students with ASD than for other disabilities, and their attitude toward the inclusion of these students was often dependent on the severity of the students' ASD profile (Barned, Knapp & Neuharth-Prichett, 2011; Cook, 2001; Glashan, Mackay & Grieve, 2004; Humphrey & Symes, 2013; McGregor & Campbell, 2001; Sansosti & Sansosti, 2012; Stoiber, Gettinger & Goetz, 1998; Teffs & Whitbread, 2009). The heterogeneity of the ASD diagnosis has been discussed extensively in this study and the challenge with addressing the heterogeneity of this population was listed as a limitation. Based on Bandura's (1986) assertion that self-efficacy influences a person's persistence and motivation for specific tasks, concern over the optimal level of specificity in the measurement of teacher self-efficacy has driven researchers to develop different types of instruments over the years. For example Ashton, Buhr, and Crocker (1984) developed a series of hypothetical teaching vignettes that asked teachers to judge themselves relative to the specific teaching task in the vignettes. Future research using the TSE-ASDI Scale could ask teachers to complete the scale relative to students presented in three different vignettes. The profiles of the students in these vignettes may be guided by the three severity levels of the ASD diagnosis as presented in the DSM-5 (2013).

In addition to investigating how the presentation of a student with ASD in the directions of the TSE-ASDI Scale influences participants' responses, future researches may also want to explore the influence of response format on the variance of participants' responses. In this current study, as with many self-report measures, the mean scores were

very high. Specifically, the mean score on the 16-item TSE-ASDI Scale for all participants on a 9-point Likert-scale was 7.45. The mean score for in-service teachers was 7.51 and for pre-service teachers 7.39. Brown (2004) supports the use of positively packed scales, (i.e., four positive response points and two negative response points), in circumstances such as this wherein participants are expected to rate themselves positively. Researchers may want to conduct another pilot test with both pre-service and in-service teachers using a positively packed response scale on the TSE-ASDI.

Finally, another avenue for future research might be longitudinal studies of teacher self-efficacy using the TSE-ASDI Scale. A longitudinal study tracking early childhood teacher candidates during their teacher preparation program might explore changes in teacher self-efficacy for teaching students with ASD in inclusive early childhood classrooms. A pre- and post-intervention administration of the TSE-ASDI Scale could be used in a multi-method developmental design. Participants who demonstrated a significant change in teacher self-efficacy for this construct would be identified in the quantitative study. These participants would then be interviewed in a qualitative study to explore what aspects of their educational program most influenced their shift in their self-efficacy beliefs.

Conclusions

The TSE-ASDI Scale is the first teacher self-efficacy instrument designed to measure teacher self-efficacy for teaching students diagnosed with ASD in inclusive early childhood classrooms. Building on Gehlbach and Brinkworth (2011) model, my process balanced the use of qualitative and quantitative research techniques. I

frontloaded the process of gathering validity evidence based on test content and response process by gathering comments and suggestions made by experts in the field as well as potential participants. Focusing on teachers' beliefs about the tasks necessary to teach students with ASD in inclusive settings as I developed items allowed me to run a more efficient pilot study and ultimately generate a more parsimonious scale.

The 16-item, unidimensional TSE-ASDI Scale is a highly reliable measure to be used by teacher educators and researchers with both pre-service and in-service teachers. Students diagnosed with ASD have the right to a free and appropriate education in the least restrictive environment. As research continues to indicate the benefits of an inclusive education for these students, teachers need preparation and professional development to feel confident in carrying out the task of teaching students with ASD in classrooms with their typically developing peers. Teacher educators and researchers now have an instrument specifically designed to measure this construct

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APPENDIX A: RESEARCH ON TEACHER SELF-EFFICACY AND AUTISM SPECTRUM DISORDER

Researcher(s)	Relevant Purpose	Participants	Measurement(s)	Teaching Task	Construct (Relevant Items)	Findings
Humphrey & Symes, 2013	To examine the perceived skill of experienced and inexperienced general education subject teachers to teach students with ASD. To examine the perceived ability of experienced and inexperienced general education subject teachers to cope with key behaviors associated with ASD	General education (main-stream) Staff members Senior managers (SM) (n=21) and subject area teachers (ST) (n=32). Secondary Schools U.K.	-Demographic information (i.e., experience teaching students with ASD; yes/no) -attitudes and beliefs about inclusion Adaptation of questionnaire used in McGregor & Campbell (2001)	Non-specified skills to teach a child with autism Managing challenging behaviors	"**Do you feel** you have the skills to teach a child with ASD?" yes/no "Below is a list of behaviors sometimes displayed by children with ASD. Please circle these according to **how well you think you could cope** with them (1=could cope easily, 5=could not cope at all) -Need for rigid routine -Poor motor skills -Special interests/high levels of understanding in maths, IT, ect. -Rigid literal thinking, e.g. not understanding metaphors, jokes, sarcasm, ect. -Lack of social understanding, e.g. unable to read facial expressions, body language, ect. -Lack of eye contact -Poor turn-taking skills -Preference for working/ playing alone -High levels of anxiety -Displaying inappropriate emotions e.g. aggression, apparent outbursts in class.	Of the general education subject area teachers, 61.3% (19) felt they had the skills to teach these students and 38.7% (12) did not. The teachers found 'displaying inappropriate emotions' the most difficult behavior to cope with and 'need for rigid routine' the easiest.

Jennett, Harris, & Mesibov, 2003	To explore how professional self-efficacy and other variables may be related to burnout in teachers of students with ASD.	Special education teachers using two popular treatment approaches for ASD in self-contained settings, Applied Behavior Analysis (ABA) (n=34) and the approach known as Treatment and Education of Autistic and Communication-Related Handicapped Children (TEACCH) (n= 30). All grade levels U.S.	-Demographic information (i.e., teaching experience including the number of years teaching children with ASD) -Self-efficacy measure; a modified version of the Teacher Efficacy Scale for Special Educators (Coladarci & Breton, 1997), a scale developed for use with special educators working in resource rooms and based on Gibson and Dembo's (1984) teacher efficacy scale - Autism Treatment Philosophy Questionnaire developed for this study to determine the	Within the personal efficacy domain, tasks included: Adapting curriculum and instruction Managing Challenging Behaviors	Level of agreement with 30 items (each item corresponding to either the dimension of personal efficacy or general efficacy) along a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree) "When a special education student is having difficult with a skill**, I am usually able** to adjust it to a student's level"	Teachers in both the TEACCH and ABA groups had high personal as well as general efficacy. A high commitment score for both approaches was positively correlated with a higher sense of personal efficacy however only a high commitment score for ABA was positively correlated with a higher sense of general efficacy.

Researcher(s)	Relevant Purpose	Participants	Measurement(s)	Teaching Task	Construct (Relevant Items)	Findings
			participants' commitment to treatment approach - Maslach Burnout Inventory-Educators Survey (Maslach, Jackson, & Schwab, 1996) to measure teacher burnout			

McGregor & Campbell (2001)	To examine the perceived skill of experienced and inexperienced general education teachers to teach students with ASD. To examine the perceived ability to cope with key behaviors associated with ASD	General (mainstream) education teachers with experience with students with ASD (n=22) and without experience with ASD (n=27) Primary and secondary schools Scotland	-Demographic information (i.e., experience teaching students with ASD) -attitudes and beliefs about inclusion	Non-specified skills to teach a child with autism Managing challenging behaviors Cope with Language Problems (under challenging behavior) proxy for Support social communication	"**Do you feel** you have the skills to teach a child with autism?" yes/no "Below is a list of behaviors sometimes displayed by autistic children. Please circle these according to **how well you think you could cope** with them (1=could cope easily, 5=could not cope at all) -Language problems -Lack of motivation -High levels of anxiety -Vulnerability -Emotional immaturity -Inappropriate emotional -Lack of self-control -Screaming	46 % of experienced general education teachers said they had the skills and 50% did not. 89% of inexperienced staff said they did not have the skills and 11% did not respond to the question. Experienced general education teachers reported feeling better able to cope with all the listed behaviors than the inexperienced teachers. Overall mean for the experienced

group was 25.79 and the inexperienced group was 31.33 t-test showed a significant difference between the groups, however only significant difference was between their coping rating for emotional immaturity when individual t-tests were run using Bonferroni's correction. Coping rating for Language problems was 2.5 for the experienced group and 2.9 for the					

inexperienced group.

Researcher(s)	Relevant Purpose	Participants	Measurement(s)	Teaching Task	Construct (Relevant Items)	Findings
Ruble, Usher & McGrew, 2011	To explore the relationship between the factors of mastery, social persuasion and affective/physiological states and the self-efficacy beliefs of teachers of students with ASD	Special Education teachers (n=35) Ages 3-9 years U.S.	-Teacher Interpersonal Self-efficacy Scale (TISES; Brouwers & Tomic, 2001). -Multifactor Leadership Questionnaire (Avolio, Bass & Jung, 1999) -Maslach Burnout Inventory (Maslach, Jackson & Leiter, 1997) -Demographic information (i.e., years of teaching experience; unclear if specific about years teaching students with ASD)	Managing challenging Behaviors Communicating & Collaborating with Staff Members	Level of agreement with 14 items in the Perceived Self-efficacy of Classroom Management subscale of the TISES along a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree) "**I can** keep defiant students involved in my lessons." "**I am** able to respond adequately to defiant students."	-No correlation between years of teaching experience or social persuasions (teachers' perception of principals' leadership) and self-efficacy - Significant associations between physiological /affective states (burnout) and self-efficacy

Researcher(s)	Relevant Purpose	Participants	Measurement(s)	Teaching Task	Construct (Relevant Items)	Findings
Ruble, Totland, Birdwhistell, McGrew & Usher, 2013	-To develop a new measure in response to Ruble et al. (2011) concern with lack of specificity of tasks to examine teacher self-efficacy for teaching students with ASD; the Autism Self-efficacy Scale for Teachers (ASSET).	Special education teachers (n=44) Grade level/age not specified U.S.	-Demographic information (i.e., teaching experience including the number of years teaching children with ASD) -Autism Self-efficacy Scale for Teachers (ASSET) -Index of Teaching Stress (ITS) Part B (Abidin, Greene, & Konold, 2004) -The Maslach Burnout Inventory (MBI; Maslach, Jackson, & Leiter, 1997)	-Assess the needs of these students -Adapt curriculum and instruction -Manage challenging behaviors -Support their social communication	30-item self-report measure of self-efficacy "Rate **your degree of confidence** by recording a number from 0 to 100 using the scale given below: Cannot do at all = 0; Moderately can do = 10 and Highly certain can do = 100. Remember to respond with your student in mind." "Conduct an assessment of this student's developmental skills/learning skills"	All items reflect one dominant factor, teachers' responses to items were internally consistent within the sample, and compared to a 100 point scale, a 6 point scale is adequate.

Teffs & Whitbred (2009)	To explore formal and informal preparation of teachers and those teachers' feelings of confidence and competence to teach students with ASD in general education classrooms.	General education teachers (n=96) Elementary, middle and high school U.S.	A three-part on-line survey developed for this study. Section 1- Demographic information (i.e., teaching experience including the number children with ASD assigned to their class during the current school year) Section II- Experiences with Students with ASD (i.e., did they have information about the student, who provided it, have feelings about students with ASD in their classroom changed, do they agree with student placement, greatest	NA	"How prepared do you feel to teach students with ASD? a. Not at all prepared b. Somewhat prepared c. Prepared d. Well prepared	More than three quarters (n=83) felt "not at all prepared" or Only "somewhat prepared"

Researcher(s)	Relevant Purpose	Participants	Measurement(s)	Teaching Task	Construct (Relevant Items)	Findings
			challenge teaching students with ASD). Section III- Training in ASD (i.e., including type of trainings received, beliefs about need for training, beliefs about preparedness to teach students with ASD.)			

APPENDIX B: ITEMS FROM TSE/ASD MEASURES ALIGNED WITH TSE-ASDI DIMENSIONS

Teaching Tasks/ Dimensions	Brouwers & Tomic, 2001 (TISES)	Humphrey & Symes, 2013 (Teacher Attitudes Toward Inclusion)	Ruble et al., 2013 (ASSETT)	Jennett et al., 2003 (Autism Treatment Philosophy Questionnaire)
Develop an understanding of the needs of students with ASD through formal and informal assessment			1. Conduct an assessment of this student's developmental skills/learning skills. 2. Describe this student's characteristics that relate to autism. 13. Assess the causes of problematic behaviors of this student. 18. Assess this student's social interaction skills. 19. Assess this student's play skills.	2. My approach to teaching focuses on both observable behaviors and other unobservable variables, such as how my student thinks, understands the environment, and integrates information. 4 .The use of schedules can help children make transitions. 13. I regularly introduce novelty to prevent resistance to change. 14. I expect my student to respond to instructions in the natural environment despite all its distractions and interruptions. 15. One of my responsibilities as a teacher is to understand the personal experience of a student with autism. 19. I find that my students with autism learn best when their strengths and interests are emphasized and their deficits are accepted and minimized.

Adapt curriculum and instruction for students with ASD	14. I am always able to make my expectations clear to students. 22. I know what rules are appropriate for my students.	45. Need for rigid routine. 46. Poor motor skills. 47. Special interests/high levels of understanding in maths, IT etc. 48. Rigid/literal thinking e.g. not understanding metaphors, jokes, sarcasm, etc. 52. Preference to working/playing alone. 53. High levels of anxiety.	3. Describe the implications for intervention based on this student's characteristics of autism. 4. Translate assessment information into teaching goals and objectives for this student. 5. Write a measureable objective for this student. 6. Write a teaching plan for this student based on goals and objectives. 7. Generate teaching activities for this student. 8. Organize the classroom to increase opportunities for	9. It is important to plan for generalization and independence of skills. 18. I'm less concerned with finding powerful reinforcers for a child than making sure activities are meaningful to him or her. 19. I find that my students with autism learn best when their strengths and interests are emphasized and their deficits are accepted and minimized.

Teaching Tasks/ Dimensions	Brouwers & Tomic, 2001 (TISES)	Humphrey & Symes, 2013 (Teacher Attitudes Toward Inclusion)	Ruble et al., 2013 (ASSETT)	Jennett et al., 2003 (Autism Treatment Philosophy Questionnaire)
			learning for this student. 9. Use visual structure to increase this student's independence. 16. Collect data to monitor this student's progress toward objectives. 17. Make use of data to re-evaluate this student's goals or objectives. 28. Motivate this student. 29. Help this student feel successful. 30. Teach this student academic skills.	

Manage challenging behaviors of students with ASD	1. If a student disrupts the lesson, I am able to redirect him quickly. 5. I can get through to most difficult students. 8. I can take adequate measures that are necessary to keep activities running efficiently. 11. I can manage my class very well. 13. I can keep defiant students involved in my lessons. 15. I am able to respond adequately to defiant students. 17. I can keep a few problem students from	54. Displaying inappropriate emotions e.g. aggression, apparent outbursts in class.	14. Design positive behavioral supports for this student. 15. Implement positive behavioral supports for this student.	20. When a student demonstrates a behavior problem, I try to figure out the underlying autism deficit or causative factor that could be the trigger mechanism. 21. I try to find the communicative intent of a student's misbehavior.

Teaching Tasks/ Dimensions	Brouwers & Tomic, 2001 (TISES)	Humphrey & Symes, 2013 (Teacher Attitudes Toward Inclusion)	Ruble et al., 2013 (ASSETT)	Jennett et al., 2003 (Autism Treatment Philosophy Questionnaire)
	running an entire class. 18. If students stop working, I can put them back on track.			

Support the social communication of students with ASD	9. I can communicate to students that I am serious about getting appropriate behavior.	49. Lack of social understanding e.g. unable to read facial expressions, body language etc.	10. Help this student understand others. 11. Help this student be understood by others. 12. Provide opportunities for communication in the classroom throughout the day for this student. 20. Teach this student social interaction. 21. Teach this student play skills. 22. Train peer models to improve the social skills of this student. 26. Help this student remain engaged. 27. Sustain this student's attention.	3. I structure the environment to stimulate my student's use of spontaneous communication.

Teaching Tasks/ Dimensions	Brouwers & Tomic, 2001 (TISES)	Humphrey & Symes, 2013 (Teacher Attitudes Toward Inclusion)	Ruble et al., 2013 (ASSETT)	Jennett et al., 2003 (Autism Treatment Philosophy Questionnaire)
Communicate and collaborate with inter-disciplinary staff members and parents	3. I am confident that, if necessary, I can ask my colleagues for advice. 7. I can always find colleagues with whom I can talk about problems at work. 20. If I feel confronted by a problem with which my colleagues can help me, I am able to approach them about this. 21. When it is necessary, I am able to ask a colleague for assistance. 23. I am able to approach my colleagues if I want to talk about problems at work.		23. Describe parental concerns regarding this student. 24. Communicate and work effectively with this student's parent(s) or caregiver. 25. Describe parental priorities for learning with regard to this student.	12. Children make the most educational progress when there is a close link between home and school.

APPENDIX C: EXPERT REVIEWERS

Area of Expertise, Name	Professional Profile
Autism, Gerard Costa, Ph.D. Director, Center for Autism and Early Childhood Mental Health Professor, Department of Early Childhood, Elementary and Literacy Education College of Education and Human Services Principal Investigator, New Jersey Autism Center of Excellence Coordinating Center Montclair State University	*Specialty area:* Relationship-based approaches to autism spectrum disorder. Principal Investigator, New Jersey Autism Center of Excellence Coordinating Center. Relevant publication: Costa, G. & Witten, M.R. (2009). Pervasive developmental disorders (Chapter 16). In B. Mowder, F. Robinson and A. Yasik (Eds.), Evidence Based Practice in Infant and Early Childhood Psychology, Hoboken, NJ:John Wiley & Son, Publishers.
Autism, Talida State, Ph.D. Assistant Professor Secondary and Special Education College of Education and Human Services Montclair State University	Research focus: Improving the outcomes of students with social, emotional, and behavioral needs. Relevant publication: State, T.M., Harrison, J.R., Kern, L. & Lewis, T.J. (2016). Feasibility and Acceptability of Classroom-Based Interventions for Students with Emotional/Behavioral Challenges at the High School Level, *Journal of Positive Behavior Interventions,* 1-11. doi:10.1177/1098300716648459

Area of Expertise, Name	Professional Profile
Autism, Elizabeth Torres, Ph.D. Associate Professor Cognitive Psychology/Computational Neuroscience Rutgers University School of Arts and Sciences	*Research focus:* Assess a broad range of natural voluntary behaviors of children with ASD and other developmental disabilities to with the goal of supporting early intervention therapies to improve communication skills and social interactions in these children. Relevant publication: Torres, E.B., Brincker, M., Isenhower, R.W., Yanovich, P., Stigler, K.A., Numberger, J.I., Metaxas, D.N. & Jose, J.V. (2013). Autism: the micro-movement perspective. *Frontiers in Integrative Neuroscience*, 7(32), 1-26. doi:10.3389/fnint.2013.00032
Inclusion. Elizabeth Erwin, Ed.D. Professor and Graduate Program Coordinator Programs in Inclusive Education: Early Childhood College of Education and Human Services Montclair State University	*Research focus:* Inclusive education, family-professional partnerships, building classroom communities for diverse learners. *Relevant publications:* Erwin, E.J., Puig, V. I., Evenson, T. L. & Beresford, M. (2012). Community and connection in inclusive early childhood education: A participatory action research investigation. *Young Exceptional Children*. *15*(4), 1-12.
Inclusion. Paula Kluth, Ph.D. Consultant, author, independent scholar	*Specialty area:* Differentiating instruction and inclusive schooling. Relevant publication: Kluth, P. (2010). You're going to love this kid!: Teaching children with autism in the inclusive classroom. Baltimore: Paul H. Brookes Publishing.

Area of Expertise, Name	Professional Profile
Inclusion. Alan Kurtz, Ph.D. Coordinator of Education and Autism Center for Community Inclusion and Disability Studies University of Maine	*Specialty area:* Autism, movement disturbances in autism, positive supports Relevant publications: Kurtz, A., Bell, J., Martin, J., & Curtis, C. (2015, November). *Parent professional partnerships: Working together to achieve successful transition*. Panel presentation at the Transition Planning: The Parent's Role "Let's Think Outside of the Box" conference, Brewer, ME.
Teacher Self-efficacy, Robert Klassen, Ph.D. Professor and Chair of the Psychology in Education Research Centre University of York Department of Education	*Research focus*: Investigating teachers' engagement, relatedness, and emotion; cross-cultural studies of teacher motivation *Relevant publication:* Klassen, R. M., Tze, V. M. C., Betts, S.M., and Gordon, K. A. (2011). Teacher efficacy research 1998-2009: Signs of progress or unfulfilled promise? *Educational Psychology Review,* 23, 21-43. doi:10.1007/s10648-010-9141-8
Teacher Self-efficacy, Kamau Oginga Siwatu, Ph.D. Associate Professor Educational Psychology and Leadership Texas Tech University	*Research focus:* Bandura was on his committee. His dissertation was constructing a measure of Teacher SE for culturally responsive teaching. Relevant Publications: Siwatu, K. O., Putnam, M., Starker, T. V., & Lewis, C. (2015). The development of the culturally responsive classroom management self-efficacy scale: Development and initial validation. Urban Education. Prepublished September 9, 2015. Siwatu, K. O., & Chesnut, S. R. (2014). The career development of preservice and inservice teachers: Why teachers' self-efficacy beliefs matter. In H. Fives & M. Gill (Eds.), International handbook of research on teachers' beliefs (pp. 212-229). New York: Routledge.

Area of Expertise, Name	Professional Profile
Teacher Self-efficacy, Ellen Usher, Ph.D. Associate Professor Educational Psychology Program Area Chair University of Kentucky College of Education	*Research focus*: Sources and effects of beliefs of personal efficacy from the perspective of social cognitive theory. Relevant Publication: Ruble, L.A., Totland, M.D., Birdwhistell, J.L., McGrew, J.H., & Usher, E.L. (2013). Preliminary study of autism self-efficacy scale for teachers (ASSET). *Research in Autism Spectrum Disorders*, 7(9), 1151-1159. doi: 10.1016/j.rasd.2013.06.006
Teacher Self-efficacy, Mike Yough, Ph.D. Assistant Professor and Program Coordinator Oklahoma State University	*Research focus:* Teacher beliefs and social cognition and their effects on student motivation. Teachers' sense of efficacy, teachers' sense of responsibility, social perspective-taking, and sense of school belonging. Relevant publications: Yough, M. S. & Fang, M. (2010). Keeping native languages in ESL class: Accounting for the role beliefs play toward mastery. Mid-Western Educational Researcher, 23 (2), 27-32

APPENDIX D: EXPERT REVIEW OF TSE-ASDI-SCALE VERSION 1

Thank you for agreeing to participate in the expert review of the items on the *Teacher Self-efficacy Autism Spectrum Disorder Inclusion (TSE-ASDI) Scale*. The purpose of this study is to develop and validate this instrument so that it can be used broadly by teacher educators and educational researchers to make valid inferences and evaluations about the construct: *teachers' self-efficacy to teach students with autism spectrum disorder (ASD) in inclusive classrooms.* I will examine the validity of the new scale for both pre-service and practicing teacher populations using a multi-method research design that will include cognitive interviews, exploratory factor analysis, and reliability analyses.

I am interested in measuring teachers' self-efficacy or their belief in their ability to carry out identified tasks with students diagnosed with ASD in inclusive educational settings. Based on an intensive review of the literature I identified five dimensions of teaching practice needed to meet the needs of children with autism in inclusive settings:

- **Dimension 1:** Develop an understanding of the needs of students with ASD through formal and informal assessment.
- **Dimension 2:** Adapt curriculum and instruction for students with ASD
- **Dimension 3:** Manage challenging behaviors of students with ASD
- **Dimension 4:** Support the social communication of students with ASD
- **Dimension 5:** Communicate and collaborate with inter-disciplinary staff members (i.e., special educator, general educator, speech and language specialist,

occupational therapist, physical therapist, mental health specialist, behavioral consultant, para-professionals) and parents or guardians.

For each dimension of practice I generated a series of items reflective of specific teaching tasks. I listed the dimensions in the gray column of the measure on the next page. For the sake of expediency, in your review, the items are organized by these dimensions. In the piloting of the *TSE-ASDI,* I will present the items in a random order.

Please review the measure based on your area of expertise. I am particularly interested in your assessment of the degree to which each item accurately/adequately taps into the target dimension. Please use track changes and the comment feature to respond to the measure.

Reviewers: Please provide any feedback on the nature of this measure. In particular: Do the items adequately reflect each dimension? Are the items written so that the target population (teachers and preservice teachers) will understand them?	Teachers' Self-Efficacy ASD Scale Version 1 Directions: **Think of a child or person with autism that you know** (or are familiar with). The list below describes several activates for working with children with autism. Please indicate how confident you are that you can do each of these activities for the child you are thinking about.

Dimensions	How confident are you that you can…?	Cannot do at all			Moderately certain I can do				Highly certain can do	
Dimension 1: Develop an understanding of the needs of students with ASD through formal and informal assessment.	Identify this student's likes and interests?	1	2	3	4	5	6	7	8	9
	Identify this student's strengths (e.g., memorization, abstract reasoning, fine motor, gross motor, music, art)?	1	2	3	4	5	6	7	8	9
	Identify sources of stress, anxiety and/or frustration for this student (e.g., sensory stimulation, motor demands, communication challenges, changes in routines or schedules)?	1	2	3	4	5	6	7	8	9
	Assess this student's ability to inhibit his or her actions?	1	2	3	4	5	6	7	8	9
	Assess this student's ability to understand cause and effect?	1	2	3	4	5	6	7	8	9
	Assess this student's ability to use symbols (e.g., pictures, picture symbols, text, spoken word) to represent objects, actions and concepts?	1	2	3	4	5	6	7	8	9

Dimensions	How confident are you that you can…?	Cannot do at all			Moderately certain I can do					Highly certain can do
Dimension 2: Adapt curriculum and instruction for students with ASD	Modify lessons to meet the representational level of this student (e.g., pictures, picture symbols, dictation, voice output, text)?	1	2	3	4	5	6	7	8	9
	Provide accommodations to allow this student to express him or herself during a lesson or activity (e.g., pictures, picture symbols, voice output, writing, typing)?	1	2	3	4	5	6	7	8	9
	Support access to and engagement with grade level curriculum content for this student's individual developmental level?	1	2	3	4	5	6	7	8	9
	Provide accommodations to the classroom environment that will allow this student to be actively engaged academically in your classroom?	1	2	3	4	5	6	7	8	9
	Provide accommodations to the classroom environment that will allow this student to be actively engaged socially in your classroom?	1	2	3	4	5	6	7	8	9
	Provide accommodations to the classroom schedule that will allow this student to be actively engaged academically in your classroom?	1	2	3	4	5	6	7	8	9
	Provide accommodations to the classroom schedule that will allow this student to be actively engaged socially in your classroom?	1	2	3	4	5	6	7	8	9
Dimension 3:	Identify the communicative intent of a challenging behavior exhibited by this student?	1	2	3	4	5	6	7	8	9

Dimensions	How confident are you that you can…?	Cannot do at all			Moderately certain I can do					Highly certain can do
Manage challenging behaviors of students with ASD	Replace challenging behavior of this student with another way of communicating a need, feeling or idea?	1	2	3	4	5	6	7	8	9
	Reduce sources of stress and frustration for this student that may be contributing to challenging behaviors?	1	2	3	4	5	6	7	8	9
	Use your own gestures, vocal tone, and/or facial affect to calm this student when he or she is anxious or agitated?	1	2	3	4	5	6	7	8	9
	Support this student's ability to calm him or herself?	1	2	3	4	5	6	7	8	9
	Support this student during unexpected changes in routines or schedules. (e.g., unannounced fire drill)?	1	2	3	4	5	6	7	8	9
Dimension 4: Support the social communication of students with ASD	Facilitate this student's ability to communicate his or her ideas, feelings and needs to familiar adults?	1	2	3	4	5	6	7	8	9
	Facilitate this student's ability to communicate his or her ideas, feelings and needs to peers?	1	2	3	4	5	6	7	8	9
	Provide opportunities for this student to make choices for him or herself?	1	2	3	4	5	6	7	8	9
	Provide opportunities for this student to solve problems?	1	2	3	4	5	6	7	8	9

Dimensions	How confident are you that you can…?	Cannot do at all			Moderately certain I can do					Highly certain can do
	Support this child's ability to understand the meaning of what familiar adults are communicating to him or her?	1	2	3	4	5	6	7	8	9
	Support this child's ability to understand the meaning of what peers are communicating to him or her?	1	2	3	4	5	6	7	8	9
	Support the participation of this student in structured social activities (e.g., playing a board game)?	1	2	3	4	5	6	7	8	9
	Support the participation of this student in unstructured social activities (e.g., engaging with peers during lunch and recess)?	1	2	3	4	5	6	7	8	9
	Support this student's ability to consider another's perspective that differs from his or hers?	1	2	3	4	5	6	7	8	9
Dimension 5: Communicate and collaborate with inter-disciplinary staff members (i.e., special educator, general educator, speech and language specialist, occupational therapist, physical therapist, mental	Describe your academic challenges with this student in such a way that you can gain strategies from an inter-disciplinary colleague that will support your in helping this student be more actively engaged academically in your classroom?	1	2	3	4	5	6	7	8	9
	Describe your social challenges with this student in such a way that you can gain strategies from an inter-disciplinary that will support you in helping this student be more actively engaged socially in your classroom?	1	2	3	4	5	6	7	8	9

Dimensions	How confident are you that you can…?	Cannot do at all			Moderately certain I can do					Highly certain can do
health specialist, behavioral consultant, para-professionals) and parents or guardians.	Plan lessons and interventions cooperatively with inter-disciplinary colleagues who provide services to this student in your classroom?	1	2	3	4	5	6	7	8	9
	Request information from an inter-disciplinary colleague about why they are providing a particular strategy for this student?	1	2	3	4	5	6	7	8	9
	Request information from an inter-disciplinary colleague about how to carry out a strategy they introduced for this student when this colleague is not present in your classroom?	1	2	3	4	5	6	7	8	9
	Define explicit tasks for working with this student to paraprofessionals in your classroom?	1	2	3	4	5	6	7	8	9
	Coach paraprofessionals in their assigned tasks for working with this student in your classroom?	1	2	3	4	5	6	7	8	9
	Establish a system of two-way communication with this student’s parents or guardians?	1	2	3	4	5	6	7	8	9
	Explain your reasons for using particular strategies or interventions with this to student to his or her parents or guardians?	1	2	3	4	5	6	7	8	9
	Seek information from the parents or guardians that will contribute to your understanding of this student’s strengths and challenges?	1	2	3	4	5	6	7	8	9

APPENDIX E: NATURE OF FEEDBACK FROM EXPERT REVIEWERS

Nature of Feedback	Description	Action
Directions	Concern that participant may not know or be familiar with a child with ASD Concern that age of child might influence participants responses to items greatly Concern regarding reliability about asking respondents to reference one child with ASD versus children with ASD in general Concern about capturing the heterogeneity of the ASD diagnosis	Include an opt-out option in the recruitment e-mail Limited the age of child in the direction to early childhood (ages 3 to 8) Reviewed other TSE measures related to ASD with attention to directions and discussions regarding these concerns Reviewed several options with dissertation advisor to address heterogeneity of ASD including vignettes of several different students with ASD and a questionnaire asking participants to describe their student with ASD Continue to ask participants to keep one child in mind and discuss this in limitations of the study
Dimensions	Dimension 1: Develop an understanding of the needs of students with ASD through formal and informal assessment Concern with double-barreled task of understanding and assessing Concern with deficit-based, clinical language (i.e., student's needs)	Reviewed literature to clarify task teachers identified as understanding students rather than assessing students Reviewed literature to clarify that teachers were focused not only on understanding needs but also the personalities and skills of students with ASD Revised Dimension 1: Develop an understanding of students with ASD
	Dimension 5: Communicate and collaborate with inter-disciplinary staff members (i.e., special educator, general	Flagged the term "inter-disciplinary" for focus during cognitive interviews

Nature of Feedback	Description	Action
	educator, speech and language specialist, occupational therapist, physical therapist, mental health specialist, behavioral consultant, para-professionals) and parents or guardians.	Removed list of members of inter-disciplinary team pending cognitive interviews
	Concern with length and clarity of dimension	Used only term "collaborate" for sake of parsimony since it subsumes ability to communicate
	Concern with participants understanding of term "inter-disciplinary"	Revised Dimension 5: Collaborate with interdisciplinary team members including families
	Concern with double-barreled task of communicate and collaborate	
	Need to portray families as members of the educational team as mandated by the Individuals with Disabilities Education Act (IDEA)	
Items	Change in Dimension 1: understanding students rather than assessing students	Reworded items in Dimension 1 to reflect refined focus
	Concern with double-barreled items (i.e., Reduce sources of *stress* and *frustration*)	Reviewed literature to clarify task and collapsed or separated all double-barreled items
	Need for examples to clarify meaning of items	Included examples for suggested items
	Concern of cognitive burden on participants due to length of item	Reduced the wording of suggested items
	Concern of cognitive burden on participants due to repetition	Reviewed items and removed several that included tasks covered in another item
	Concern with clarity of items	Accepted some changes of wording and flagged other terms for investigation during cognitive interviews
	Suggestions to include terms "appropriate" or "improve"	Rejected due to the implication that the child be fixed to fit into a set of societal norms rather than focus on modifications to lessons or the classroom

Nature of Feedback	Description	Action
		environment as mandated by IDEA

APPENDIX F: TSE-ASDI SCALE: VERSION 2

Directions: **Think of a child between the ages of 3 and 8 with autism that you know** (or are familiar with). The list below describes several activities for working with children with autism. Please indicate how confident you are that you can do each of these activities for the child you are thinking about.

Dimensions	How confident are you that you can…?	Cannot do at all			Moderately certain I can do				Highly certain can do	
Dimension 1: Develop an understanding of students with ASD	Understand what interests this student?	1	2	3	4	5	6	7	8	9
	Recognize this student's strengths (e.g., memorization, abstract reasoning, fine motor, gross motor, music, art)?	1	2	3	4	5	6	7	8	9
	Recognize sources of stress for this student (e.g., **sensory stimulation**, motor demands, expressive communication challenges, comprehension challenges, changes in routines or schedules, the emotions of another person)?	1	2	3	4	5	6	7	8	9
	Understand when this student's behavior is related to stress (i.e., hitting, fleeing, rocking, withdrawing)?	1	2	3	4	5	6	7	8	9
Dimension 2: Adapt curriculum and instruction for	Understand this student's ability to use symbols to represent ideas (e.g., pictures, picture symbols, spoken word, text)?	1	2	3	4	5	6	7	8	9
	Modify lessons to meet the **representational** level of this student (e.g., pictures, picture symbols, dictation, voice output, text)?	1	2	3	4	5	6	7	8	9

Dimensions	How confident are you that you can…?	Cannot do at all			Moderately certain I can do				Highly certain can do	
students with ASD	Provide multiple ways to allow this student to express him or herself during a lesson or activity (e.g., pictures, picture symbols, voice output, writing, typing)?	1	2	3	4	5	6	7	8	9
	Make modifications to the grade level curriculum content so this student can engage in **curricular activities** (i.e., participate in a math lesson, contribute to a group project)?	1	2	3	4	5	6	7	8	9
	Arrange the classroom environment to help this student to be more independent (i.e., provide picture sequences of a routine task)?	1	2	3	4	5	6	7	8	9
Dimension 3: Manage challenging behaviors of students with ASD	Identify the underlying cause of a challenging behavior exhibited by this student (e.g., sensory stimulation, motor demands, expressive communication challenges, comprehension challenges, changes in routines or schedules, the emotions of another person)?	1	2	3	4	5	6	7	8	9
	Reduce sources of stress for this student that may be contributing to challenging behaviors?	1	2	3	4	5	6	7	8	9
	Replace challenging behavior of this student with another way of communicating?	1	2	3	4	5	6	7	8	9

Dimensions	How confident are you that you can…?	Cannot do at all			Moderately certain I can do				Highly certain can do	
Dimension 4: Support the social communication of students with ASD	Remain calm yourself so that you can help to calm this student when necessary?	1	2	3	4	5	6	7	8	9
	Teach this student strategies to calm him or herself?	1	2	3	4	5	6	7	8	9
	Facilitate this student's ability to communicate ideas to familiar adults?	1	2	3	4	5	6	7	8	9
	Facilitate this student's ability to communicate ideas to peers?	1	2	3	4	5	6	7	8	9
	Support peers' ability to understand the meaning of what this child is communicating to them?	1	2	3	4	5	6	7	8	9
	Support this child's ability to understand the meaning of what familiar adults are communicating?	1	2	3	4	5	6	7	8	9
	Support this child's ability to understand the meaning of what peers are communicating?	1	2	3	4	5	6	7	8	9

Dimensions	How confident are you that you can…?	Cannot do at all						Moderately certain I can do		Highly certain can do
Dimension 5: Collaborate with inter-disciplinary team members including families	Support the participation of this student in structured social activities (e.g., playing a board game)?	1	2	3	4	5	6	7	8	9
	Support the participation of this student in unstructured social activities (e.g., engaging with peers during lunch and recess)?	1	2	3	4	5	6	7	8	9
	Support this student's ability to consider another's perspective that differs from his or hers?	1	2	3	4	5	6	7	8	9
	Explain your academic challenges with this student to an inter-disciplinary colleague?	1	2	3	4	5	6	7	8	9
	Explain your social communication challenges with this student to an inter-disciplinary colleague?	1	2	3	4	5	6	7	8	9
	Explain your behavioral challenges with this student to an interdisciplinary colleague?	1	2	3	4	5	6	7	8	9
	Plan lessons cooperatively with inter-disciplinary colleagues?	1	2	3	4	5	6	7	8	9
	Incorporate strategies provided by interdisciplinary team members, including families, into your accommodations and modifications for this student?	1	2	3	4	5	6	7	8	9
	Define explicit tasks for working with this student to paraprofessionals?	1	2	3	4	5	6	7	8	9

Dimensions	How confident are you that you can…?	Cannot do at all					Moderately certain I can do			Highly certain can do
	Coach paraprofessionals in their assigned tasks for working with this student?	1	2	3	4	5	6	7	8	9
	Establish a system of two-way communication with this student's family?	1	2	3	4	5	6	7	8	9
	Explain your reasons for using particular strategies or interventions with this to student to his or her family?	1	2	3	4	5	6	7	8	9
	Seek information from the family that will contribute to your understanding of this student's strengths and challenges?	1	2	3	4	5	6	7	8	9

APPENDIX G: CONSENT DOCUMENT: COGNITIVE INTERVIEW STUDY

Please read below with care. You can ask questions at any time. You can talk to other people before you sign this form.

Study's Title: Developing and Validating the Teacher Self-efficacy for Teaching Students with Autism Spectrum Disorder in Inclusive Classrooms (TSE-ASDI) Scale

Why is this study being done? This study is being done to make sure that the directions for and items on the TSE-ASDI Scale are clearly understood by pre-service and practicing early childhood teachers.

What will happen while you are in the study? We will meet in person to complete the following tasks. First, I will ask you to complete a demographic questionnaire. This questionnaire asks about your background, educational status, teaching experience, as well as experience with individuals diagnosed with autism spectrum disorder.

Second, I will make an audio recording as I ask you to complete the following tasks. I will ask you to read the directions for the TSE-ASDI Scale and put the items in your own words. I will also ask you to read each of the 32 items on the TSE-ASDI Scale. For each item I will ask you to put the item in your own words, share the thoughts you have while reading each item (think aloud) and, explain how you would score yourself on each item. I may prompt you to explain more or remind you to think out load.

Time: Participation in this study will take between 90 minutes.

Risks: You may feel overwhelmed, frustrated, bored, or confused while participating in this study. You may get tired from the number of questions. You are

allowed to take breaks during the study. During the think aloud process you may feel awkward or make a comment that you regret. You may ask me to delete any statements from the recording.

Benefits: You will receive a learning experience in the how to make a scale or survey. This content is related to inclusive education and may help you in your academic endeavors. Participation in this study will give you an understanding of how educational research is conducted. This study will benefit the field of education and teacher education in particular.

Compensation: You will be offered a coffee or small meal to enjoy during the interview.

Who will know that you are in this study? Only myself and my faculty advisor, Helenrose Fives will know that you are in this study. You will not be linked to any presentations or publications. We will keep who you are confidential according to the law.

Do you have to be in the study? You do not have to be in this study. You are a volunteer! It is okay if you want to stop at any time and not be in the study. You do not have to answer any questions you do not want to answer.

Do you have any questions about this study? Phone or email Corinne G. Catalano 973-655-4358 or catalanoc@montclair.edu Center for Autism and Early Childhood Mental Health, Montclair State University.

Do you have any questions about your rights? Phone or email the IRB Chair, Dr. Katrina Bulkley (reviewboard@mail.montclair.edu or 973-655-3021).

One copy of this consent form is for you to keep.

Please select one of the following:

☐ I will consent to participate in the research study. (If selected please sign below)

☐ I do not consent to participate in this study.

Statement of Consent

My signature below indicates that:

- I have read this form.
- I agree to participate in the project described.
- I agree for my interview to be digitally recorded.
- The study purposes, details of involvement, and possible risks have been explained to my satisfaction.
- I understand that I can withdraw at any time.

Print your name here Sign your name here Date

Dr. Helenrose Fives Signature Date

Corinne G. Catalano Signature Date

APPENDIX H: CONSENT DOCUMENT: COGNITIVE INTERVIEW STUDY PARTICIPANTS; SKYPE

Please read below with care. You can ask questions at any time. You can talk to other people before you sign this form.

Study's Title: Developing and Validating the Teacher Self-efficacy for Teaching Students with Autism Spectrum Disorder in Inclusive Classrooms (TSE-ASDI) Scale

Why is this study being done? This study is being done to make sure that the directions for and items on the TSE-ASDI Scale are clearly understood by pre-service and practicing early childhood teachers.

What will happen while you are in the study?

First, I will send you the documents via email in advance of our meeting.

Second, during our Skype call I will ask you to complete a demographic questionnaire. This questionnaire asks about your background, educational status, teaching experience, as well as experience with individuals diagnosed with autism spectrum disorder.

Third, I will make an audio recording as I ask you to complete the following tasks. I will ask you to read the directions for the TSE-ASDI Scale and put the items in your own words. I will also ask you to read each of the 32 items on the TSE-ASDI Scale. For each item I will ask you to put the item in your own words, share the thoughts you have while reading each item (think aloud) and, explain how you would score yourself on each item. I may prompt you to explain more or remind you to think out load.

Time: Participation in this study will take between 90 minutes.

Risks: You may feel overwhelmed, frustrated, bored, or confused while participating in this study. You may get tired from the number of questions. You are allowed to take breaks during the study. During the think aloud process you may feel awkward or make a comment that you regret. You may ask me to delete any statements from the recording.

Benefits: You will receive a learning experience in the how to make a scale or survey. This content is related to inclusive education and may help you in your academic endeavors. Participation in this study will give you an understanding of how educational research is conducted. This study will benefit the field of education and teacher education in particular.

Who will know that you are in this study? Only myself and my faculty advisor, Helenrose Fives will know that you are in this study. You will not be linked to any presentations or publications. We will keep who you are confidential according to the law.

Do you have to be in the study? You do not have to be in this study. You are a volunteer! It is okay if you want to stop at any time and not be in the study. You do not have to answer any questions you do not want to answer.

Do you have any questions about this study? Phone or email Corinne G. Catalano 973-655-4358 or catalanoc@montclair.edu Center for Autism and Early Childhood Mental Health, Montclair State University.

Do you have any questions about your rights? Phone or email the IRB Chair, Dr. Katrina Bulkley (reviewboard@mail.montclair.edu or 973-655-3021).

One copy of this consent form is for you to keep.

Please select one of the following:

☐ I will consent to participate in the research study. (If selected please sign below)

☐ I do not consent to participate in this study.

Statement of Consent

My signature below indicates that:

- I have read this form.
- I agree to participate in the project described.
- I agree for my interview to be digitally recorded.
- The study purposes, details of involvement, and possible risks have been explained to my satisfaction.
- I understand that I can withdraw at any time.

Print your name here Sign your name here

Date

Dr. Helenrose Fives Signature

Date

Corinne G. Catalano Signature

Date

APPENDIX I: SEMI-STRUCTURED COGNITIVE INTERVIEW QUESTIONS

Anticipated probes, asked of all participants

Initial probes (asked for the directions):

1. Can you please read the directions aloud?
2. Can you put the directions into your own words?
3. Based on these directions, would you be able to select a child to keep in mind while completing the scale?

Initial probes (asked for each item):

1. Can you please read the item aloud?
2. Can you put the question into your own words?
3. Can you think aloud and tell me every thought you have as you answer the question?
4. If you responded to this question what score would you choose?
5. Why would you respond that way?

Further probes (asked once per participant):

1. What do you think of when you hear the term *sensory stimulation*?
2. What do you think of when you hear the term *representational level*?
3. What do you think of when you hear the term *curricular activities*?
4. What do you think about when you hear the term *facilitate this student's ability*?

Conditional probes, asked of some participants

1. It sounded like it was difficult for you to put the directions or that question into your own words; what made that item difficult for you?

2. It seemed difficult for you to pick a child to keep in mind while completing the scale; why was this difficult for you?
3. It seemed difficult for you to pick a response to that question; why do you think that was?
4. Why do you think you had difficulty defining that term?

APPENDIX J: BACKGROUND CHARACTERISTICS AND DEMOGRAPHIC QUESTIONNAIRE

Developing and Validating the Teacher Self-Efficacy for Teaching Students with Autism Spectrum Disorder in Inclusive Classrooms (TSE-ASDI) Scale

Background Characteristics and Demographic Questionnaire

1. What is your gender?

   ☐ Male

   ☐ Female

   ☐ Self-describe

   _____

2. Please circle your age range.

   20 – 24 25 – 29 30 – 34 35 – 39 40 – 44

   45 – 49 50 – 54 55 – 59 60 – 64 65 – 69

3. What is your race/ethnicity?

   ☐ American Indian or Alaskan Native

   ☐ Asian

   ☐ Black or African-American

   ☐ Hispanic or Latino

   ☐ Native Hawaiian or Other Pacific Islander

   ☐ White

- ☐ Self-describe

  _____

4. What is the highest level of education you have completed?
   - ☐ Bachelors Degree
   - ☐ Masters Degree
   - ☐ Masters Degree Plus 30 Credits
   - ☐ Ph.D./Ed.D.

5. What is your teaching status?
   - ☐ Practicing teacher/in-service teacher
   - ☐ Pre-service teacher- Undergraduate Program
   - ☐ Pre-service teacher- Graduate Program
   - ☐ Other

     _____

6. Have you ever spent time working in an inclusive classroom?
   - ☐ Yes
   - ☐ No

7. In what country are you currently teaching or studying to become a teacher?
   - ☐ United States

- ☐ Canada
- ☐ Other

_____

—

8. What is your experience with individuals diagnosed with autism spectrum disorder (ASD)? *Check all that apply*.
   - ☐ No experience with an individual with ASD
   - ☐ Parent of child with ASD
   - ☐ Sibling of individual with ASD
   - ☐ Relative/friend of individual with ASD
   - ☐ Teacher of child with ASD
   - ☐ Paraprofessional for child with ASD
   - ☐ Service provider to individual with ASD outside of school
   - ☐ Other

     _____

9. If you are a pre-service teacher, what teacher certification(s) are you working toward?
   - ☐ Not a pre-service teacher
   - ☐ Pre-school to 3rd grade/Early Childhood Education
   - ☐ Kindergarten to 6th grade/Elementary Education

- ☐ Teacher of Students with Disabilities/Special Education
- ☐ Pre-school to 3rd grade and Teacher of Students with Disabilities/Special Education
- ☐ Kindergarten to 6th grade and Teacher of Students with Disabilities/Special Education
- ☐ Other

_____

10. If you are a practicing teacher, what is your teaching certification?

- ☐ Not a practicing teacher
- ☐ Pre-school to 3rd grade/Early Childhood Education
- ☐ Kindergarten to 6th grade/Elementary Education
- ☐ Teacher of Students with Disabilities/Special Education
- ☐ Pre-school to 3rd grade and Teacher of Students with Disabilities /Special Education
- ☐ Kindergarten to 6th grade and Teacher of Students with Disabilities/Special Education
- ☐ Other

_____

11. If you are a practicing teacher, what grade level are you currently teaching?

- ☐ Not a practicing teacher

- ☐ Pre-school
- ☐ Kindergarten
- ☐ First Grade
- ☐ Second Grade
- ☐ Third Grade
- ☐ Other

_____

12. If you are a practicing teacher, is the classroom you are currently in inclusive (children with identified special needs in class with children without identified special needs)?

- ☐ Yes
- ☐ No
- ☐ Part of the day inclusive and part self-contained

APPENDIX K: TSES

Teachers' Sense of Efficacy Scale[1] (short form)

Tschannen-Moran & Woolfolk Hoy, 2001

Teacher Beliefs Directions: This questionnaire is designed to help us gain a better understanding of the kinds of things that create difficulties for teachers in their school activities. Please indicate your opinion about each of the statements below. Your answers are confidential.	How much can you do? Nothing	Very Little	Some Influence	Quite A Bit	A Great Deal
1. How much can you do to control disruptive behavior in the classroom?	(1)	(2)	(3)	(4)	(5) (6) (7) (8) (9)
2. How much can you do to motivate students who show low interest in school work?	(1)	(2)	(3)	(4)	(5) (6) (7) (8) (9)
3. How much can you do to get students to believe they can do well in school work?	(1)	(2)	(3)	(4)	(5) (6) (7) (8) (9)
4. How much can you do to help your students value learning?	(1)	(2)	(3)	(4)	(5) (6) (7) (8) (9)
5. To what extent can you craft good questions for your students?	(1)	(2)	(3)	(4)	(5) (6) (7) (8) (9)
6. How much can you do to get children to follow classroom rules?	(1)	(2)	(3)	(4)	(5) (6) (7) (8) (9)
7. How much can you do to calm a student who is disruptive or noisy?	(1)	(2)	(3)	(4)	(5) (6) (7) (8) (9)
8. How well can you establish a classroom management system with each group of students?	(1)	(2)	(3)	(4)	(5) (6) (7) (8) (9)
9. How much can you use a variety of assessment strategies?	(1)	(2)	(3)	(4)	(5) (6) (7) (8) (9)
10. To what extent can you provide an alternative explanation or example when students are confused?	(1)	(2)	(3)	(4)	(5) (6) (7) (8) (9)
11. How much can you assist families in helping their children do well in school?	(1)	(2)	(3)	(4)	(5) (6) (7) (8) (9)
12. How well can you implement alternative strategies in your classroom?	(1)	(2)	(3)	(4)	(5) (6) (7) (8) (9)

APPENDIX L: TSE-ASDI VERSION 3

Teachers' Self-Efficacy for Autism Spectrum Disorder Inclusion (TSE-ASDI)

Scale Version 3

Directions: **Think of a child between the ages of 3 and 8 with autism that you know** (or are familiar with). The list below describes several activities for working with children with autism. Please indicate how confident you are that you can do each of these activities for the child you are thinking about in an inclusive classroom, by circling the number on the scale.

For the child you are thinking about, how confident are you that you can…?	Cannot do at all								Highly certain can do
Arrange the classroom environment to help this student to be more independent (i.e., provide picture sequences of a routine task)?	1	2	3	4	5	6	7	8	9
Coach paraprofessionals/educational or teaching assistants in their assigned tasks for working with this student?	1	2	3	4	5	6	7	8	9
Recognize this student's strengths (e.g., memorization, abstract reasoning, fine motor, gross motor, music, art)?	1	2	3	4	5	6	7	8	9
Delegate explicit tasks to the paraprofessional/educational or teaching assistant working with this student?	1	2	3	4	5	6	7	8	9
Establish a system of two-way communication with this student's family?	1	2	3	4	5	6	7	8	9
Remain calm yourself so that you can help to calm this student when necessary?	1	2	3	4	5	6	7	8	9
Plan lessons cooperatively with inter-disciplinary colleagues (e.g., speech & language therapist, occupational therapist, another teacher) who are working with this student?	1	2	3	4	5	6	7	8	9
Explain the challenges you are having with this student to an inter-disciplinary colleague (e.g., speech & language therapist, occupational therapist, another teacher) in order to seek strategies and interventions to use in your classroom?	1	2	3	4	5	6	7	8	9
Understand what interests this student?	1	2	3	4	5	6	7	8	9

For the child you are thinking about, how confident are you that you can…?	Cannot do at all								Highly certain can do
Facilitate this student's ability to communicate his or her ideas to familiar adults?	1	2	3	4	5	6	7	8	9
Support the participation of this student in unstructured social activities (e.g., engaging with peers during lunch, recess, or free-play)?	1	2	3	4	5	6	7	8	9
Identify why this student might be exhibiting a challenging behavior (e.g., overwhelmed by too much sensory stimuli, challenged by motor demand, frustrated by inability to communicate, anxious because of changes in routines or schedules, upset by the emotions of another person)?	1	2	3	4	5	6	7	8	9
Help classmates to understand what this child is communicating to them?	1	2	3	4	5	6	7	8	9
Modify how lessons are presented to allow this student to understand the content (e.g., provide visuals, reduce language)?	1	2	3	4	5	6	7	8	9
Seek information from the family that will contribute to your understanding of this student's strengths and challenges?	1	2	3	4	5	6	7	8	9
Support the participation of this student in structured social activities (e.g., rule-based games)?	1	2	3	4	5	6	7	8	9
Reduce this student's challenging behaviors in your classroom?	1	2	3	4	5	6	7	8	9
Make changes to your teaching and/or the classroom environment to reduce challenges for this student?	1	2	3	4	5	6	7	8	9
Help this child understand what familiar adults are communicating to him or her?	1	2	3	4	5	6	7	8	9
Provide multiple ways for this student to express his or her answers or ideas during a lesson or activity (e.g., pointing to pictures or picture symbols, speaking, typing)?	1	2	3	4	5	6	7	8	9
Recognize things that this student finds challenging or upsetting (e.g., loud noises, handwriting, expressive communication, comprehension of language or text, changes in routines or schedules, the emotions of another person)?	1	2	3	4	5	6	7	8	9
Incorporate strategies provided by others who know this student well (e.g., speech & language therapist, occupational therapist, another teacher, parents, caregivers) into your accommodations and motivations?	1	2	3	4	5	6	7	8	9
Plan curricular activities (i.e., math lesson, science group project) to allow this student to actively participate?	1	2	3	4	5	6	7	8	9

For the child you are thinking about, how confident are you that you can…?	Cannot do at all							Highly certain can do	
Help this child ability understand what classmates are communicating to him or her?	1	2	3	4	5	6	7	8	9
Support this student's ability to consider another person's perspective that differs from his or hers?	1	2	3	4	5	6	7	8	9
Teach this student strategies to calm him or herself?	1	2	3	4	5	6	7	8	9
Facilitate this student's ability to communicate his or her ideas to classmates?	1	2	3	4	5	6	7	8	9
Explain your reasons for using particular strategies or interventions with this student to his or her family?	1	2	3	4	5	6	7	8	9

APPENDIX M: CONSENT DOCUMENT STUDENT

Please read the following with care and indicate your agreement at the end of this page.

Study's Title: Developing and Validating the Teacher Self-efficacy for Teaching Students with Autism Spectrum Disorder in Inclusive Classrooms (TSE-ASDI) Scale

Why is this study being done? This study is being done to validate a scale intended to measure teachers' beliefs in their ability for teaching students diagnosed with autism spectrum disorder in inclusive early childhood classrooms, the *Teacher Self-efficacy for Teaching Students with ASD in Inclusive Classrooms Scale*: TSE-ASDI, for use with both pre-service and in-service teachers. This scale can be used by teacher educators and education researchers to help them better understand how to prepare and support teachers working with students with autism spectrum disorder in general education classrooms.

What will happen while you are in the study? Participation in this study involves completing three documents (link below):

1. A background survey, that asks about your demographics, educational experiences, and experiences in working with children with autism.
2. A 12-item scale that asks about your general teaching beliefs, and
3. A 32-item scale that asks about your beliefs about teaching children with autism.

Time: It should take you about 15-20 minutes to complete all three documents.

Risks: While participating in the study you may experience mild discomfort while you reflect on your experience. You may also feel bored or confused. The information we gather from you are anonymous. However, any information sent over the

internet may be at risk of interception by third parties. We are using a secure web service to gather your responses.

Benefits: Participation in this study provides a chance to think about your professional beliefs. Your answers will be used to inform the teacher education field and improve the practice of others. You may also learn about the research process by participating.

Who will know that you are in this study? You will not be linked to any presentations of the findings from this study. I will keep who you are anonymous.

Do you have to be in the study? You do NOT have to be in this study. You are a volunteer! It is okay if you want to stop at any time and not be in the study. You do not have to answer any questions you do not want to answer.

Do you have any questions about this study? Contact Corinne Catalano (catalanoc@montclair.edu; 973-655-4358; Center for Autism and Early Childhood Mental Health, Montclair State University) with any questions you have about this study.

Do you have any questions about your rights as a research participant? Phone or email the IRB Chair, Dr. Katrina Bulkley, at 973-655-5189 or reviewboard@mail.montclair.edu.

Statement of Consent

By clicking the link below, I confirm that

- I have read this message.
- I understand the purpose of the study, what my involvement will entail, and possible risks.

- I understand that I can end my participation at any time.
- I am 18 years of age (or older).
- I agree to participate in this study.

Yes, I will participate in this study. No Thanks, I will not participate in this study.

(Links to Research Survey) (Links to "thanks for your interest"/closes survey)

The study has been approved by the Montclair State University Institutional Review Board as study #FYI-16-17-571 on May 3, 2017.

Please feel free to print a copy of this consent for your records.

APPENDIX N: ONLINE CONSENT

Please read the following with care and indicate your agreement at the end of this page.

Study's Title: Developing and Validating the Teacher Self-efficacy for Teaching Students with Autism Spectrum Disorder in Inclusive Classrooms (TSE-ASDI) Scale

Why is this study being done? This study is being done to validate a scale intended to measure teachers' beliefs in their ability for teaching students diagnosed with autism spectrum disorder in inclusive early childhood classrooms, the *Teacher Self-efficacy for Teaching Students with ASD in Inclusive Classrooms Scale*: TSE-ASDI, for use with both pre-service and in-service teachers. This scale can be used by teacher educators and education researchers to help them better understand how to prepare and support teachers working with students with autism spectrum disorder in general education classrooms.

What will happen while you are in the study? Participation in this study involves completing three documents (link below):

1. A background survey, that asks about your demographics, educational experiences, and experiences in working with children with autism.
2. A 12-item scale that asks about your general teaching beliefs, and
3. A 32-item scale that asks about your beliefs about teaching children with autism.

Time: It should take you about 15-20 minutes to complete all three documents.

Risks: While participating in the study you may experience mild discomfort while you reflect on your experience. You may also feel bored or confused. The information we gather from you are anonymous. However, any information sent over the

internet may be at risk of interception by third parties. We are using a secure web service to gather your responses.

Benefits: Participation in this study provides a chance to think about your professional beliefs. Your answers will be used to inform the teacher education field and improve the practice of others. You may also learn about the research process by participating.

Compensation: After completing the three documents you will be directed to a new survey form where you can enter your email address to be included in a drawing to win one of four fifty dollar Amazon gift cards. These emails will be used solely for the purposes of the drawing, and to send the winners the gift cards electronically. Upon completion of the drawing, the information in this separate survey will be deleted.

Who will know that you are in this study? You will not be linked to any presentations of the findings from this study. I will keep who you are anonymous.

Do you have to be in the study? You do NOT have to be in this study. You are a volunteer! It is okay if you want to stop at any time and not be in the study. You do not have to answer any questions you do not want to answer.

Do you have any questions about this study? Contact Corinne Catalano (catalanoc@montclair.edu; 973-655-4358; Center for Autism and Early Childhood Mental Health, Montclair State University) with any questions you have about this study.

Do you have any questions about your rights as a research participant? Phone or email the IRB Chair, Dr. Katrina Bulkley, at 973-655-5189 or reviewboard@mail.montclair.edu.

Statement of Consent

By clicking the link below, I confirm that

- I have read this message.
- I understand the purpose of the study, what my involvement will entail, and possible risks.
- I understand that I can end my participation at any time.
- I am 18 years of age (or older).
- I agree to participate in this study.

Yes, I will participate in this study. No Thanks, I will not participate in this study.

(Links to Research Survey) (Links to "thanks for your interest"/closes survey)

The study has been approved by the Montclair State University Institutional Review Board as study #FY16-17-571 on May 3, 2017.

Please feel free to print a copy of this consent for your records.

APPENDIX O: IN PERSON PLEA CONFERENCE PARTICIPANTS

Hello, my name is Corinne Catalano and I am the Assistant Director for Consultation Services at the Center for Autism and Early Childhood Mental Health here at Montclair State University. I am conducting my dissertation research in the Teacher Education and Teacher Development doctoral program also here at MSU. My research involves developing and validating an instrument, the Teacher Self-efficacy for Teaching Students with Autism Spectrum Disorder in Inclusive Classrooms (TSE-ASDI) Scale, to measure the self-efficacy of both teacher candidates and practicing early childhood teachers for teaching students diagnosed with autism spectrum disorder (ASD) in inclusive classrooms.

I'm here today to ask all teacher candidates and practicing early childhood teachers to consider participating in this study while you are attending this conference. You all received a packet including four documents;

4. A consent form.
5. A background survey, that asks about your demographics, educational experiences, and experiences in working with children with autism.
6. A 12-item scale that asks about your general teaching beliefs, and
7. A 32-item scale that asks about your beliefs about teaching children with Autism.

I am asking that you take you about 15-20 minutes to complete all four documents while you are here today. Your responses are completely anonymous and all findings will be reported as a summary. If you are willing to participate, I ask you to put the completed documents back into the envelope and place them in the box found on our table (state

location of the table). There you will also find a small token of appreciation (state the description of gift).

By completing the survey and scales you will be contributing to the field of teacher education and development. The goal of this study is to create a tool that can be used broadly by teacher educators and educational researchers to make valid inferences and evaluations about teachers' self-efficacy to carry out the identified tasks with students with ASD in inclusive educational settings.

This study has been approved by the Montclair State University Institutional Review Board.

Are there any questions? If you have any questions later I will be available throughout the day or you can email me at catalanoc@montclair.edu.

Thank you for your time. I hope you will be willing to participate in my study.

APPENDIX P: CONSENT DOCUMENT: TSE-ASDI IN-PERSON STUDY PARTICIPANTS

Please read below with care. You can ask questions at any time. You can talk to other people before you sign this form.

Study's Title: Developing and Validating the Teacher Self-efficacy for Teaching Students with Autism Spectrum Disorder in Inclusive Classrooms (TSE-ASDI) Scale

Why is this study being done? This study is being done to validate a scale intended to measure teachers' beliefs in their ability for teaching students diagnosed with autism spectrum disorder in inclusive early childhood classrooms, the *Teacher Self-efficacy for Teaching Students with ASD in Inclusive Classrooms Scale*: TSE-ASDI, for use with both pre-service and in-service teachers. This scale can be used by teacher educators and education researchers to help them better understand how to prepare and support teachers working with students with autism spectrum disorder in general education classrooms.

What will happen while you are in the study? Participation in this study involves completing three documents:

8. A background survey, that asks about your demographics, educational experiences, and experiences in working with children with autism.
9. A 12-item scale that asks about your general teaching beliefs, and
10. A 32-item scale that asks about your beliefs about teaching children with autism.

Time: It should take you about 15-20 minutes to complete all three documents.

Risks: While participating in the study you may experience mild discomfort while you reflect on your experience. You may also feel bored or confused. The information we gather from you are anonymous. However, any information sent over the internet may be at risk of interception by third parties. We are using a secure web service to gather your responses.

Benefits: Participation in this study provides a chance to think about your professional beliefs. Your answers will be used to inform the teacher education field and improve the practice of others. You may also learn about the research process by participating.

Compensation: When you submit this consent form and the three documents you will be offered a small token of appreciation for your participation (your choice of a candy bar or MSU pencil).

Who will know that you are in this study? You will not be linked to any presentations of the findings from this study. I will keep who you are anonymous.

Do you have to be in the study? You do NOT have to be in this study. You are a volunteer! It is okay if you want to stop at any time and not be in the study. You do not have to answer any questions you do not want to answer.

Do you have any questions about this study? Contact Corinne Catalano (catalanoc@montclair.edu; 973-655-4358; Center for Autism and Early Childhood Mental Health, Montclair State University) with any questions you have about this study.

Do you have any questions about your rights as a research participant?

Phone or email the IRB Chair, Dr. Katrina Bulkley, at 973-655-5189 or reviewboard@mail.montclair.edu.

One copy of this consent form is for you to keep.

Please select one of the following:

☐ I will consent to participate in the research study. (If selected please sign below)

☐ I do not consent to participate in this study.

Statement of Consent

My signature below indicates that:

- I have read this form.
- I agree to participate in the project described.
- The study purposes, details of involvement, and possible risks have been explained to my satisfaction.
- I understand that I can withdraw at any time.

Print your name here Sign your name here

Date

Dr. Helenrose Fives Signature

Date

Corinne G. Catalano Signature Date

APPENDIX Q: RECRUITMENT EMAIL-FACULTY

Dear (Faculty Name):

I would like to request that you invite your undergraduate and/or graduate early childhood teacher candidates to participate in a research project that will be happening over the next few weeks. I am developing and validating an instrument, the Teacher Self-efficacy for Teaching Students with ASD in Inclusive Classrooms (TSE-ASDI) Scale, to measure teacher candidates and practicing early childhood teachers' beliefs in their ability to teach students diagnosed with autism spectrum disorder (ASD) in inclusive classrooms. In order to participate in this study participants must be either practicing P-3 teachers or enrolled in a P-3 teacher certification program.

I have prepared recruitment e-mails and hand-outs for distribution to your students (See attached). I also have prepared these recruitment materials to include the option of receiving extra credit for completion of the documents if you choose to offer this to your students (See attached). (If this is addressed to a Montclair State University faculty member, I would also offer the option of an in-person plea and attached those recruitment protocols).

To participate in this study students would simply follow the link below and complete four documents:

1. A consent form.
2. A background survey, that asks about your demographics, educational experiences, and experiences in working with children with autism.
3. A 12-item scale that asks about your general teaching beliefs, and

4. A 32-item scale that asks about your beliefs about teaching children with Autism.

It should take them about 15-20 minutes to complete all four documents. Responses are completely anonymous and all findings will be reported as a summary.

By completing the survey and scales your students will be contributing to the field of teacher education and development. The goal of this study is to create a scale that can be used by teacher educators and education researchers. This research scale would help them better understand how to prepare and support teachers working with students with ASD in general education classrooms.

This study has been approved by the Montclair State University Institutional Review Board. If you have any questions please contact me, Corinne Catalano, at catalanoc@montclair.edu.

Link to documents:

Link for students with no extra credit:

https://msusurveys.montclair.edu/msusurvey/index.php/632199/lang-en

Thank you,

Corinne G. Catalano, Ph.D. Candidate

Assistant Director for Consultation Services

Center for Autism and Early Childhood Mental Health

College of Education and Human Services

Montclair State University

catalanoc@montclair.edu

APPENDIX R: RECRUITMENT IN PERSON PLEA: MSU STUDENTS

Hello, my name is Corinne Catalano and I am the Assistant Director for Consultation Services at the Center for Autism and Early Childhood Mental Health here at Montclair State University. I am conducting my dissertation research in the Teacher Education and Teacher Development doctoral program also here at MSU. My research involves developing and validating an instrument, the Teacher Self-efficacy for Teaching Students with Autism Spectrum Disorder in Inclusive Classrooms (TSE-ASDI) Scale, to measure teacher candidates and practicing early childhood teachers' beliefs about their ability to teach students diagnosed with autism spectrum disorder (ASD) in inclusive classrooms.

I'm here today to ask all teacher candidates and practicing early childhood teachers in class to consider participating in this study by completing my online documents.

Later this week I will send you an email with a link to respond to four documents;

4. A consent form.
5. A background survey, that asks about your demographics, educational experiences, and experiences in working with children with autism.
6. A 12-item scale that asks about your general teaching beliefs, and
7. A 32-item scale that asks about your beliefs about teaching children with Autism.

It should take you about 15-20 minutes to complete all four documents. Your responses are completely anonymous and all findings will be reported as a summary. This study has been approved by the Montclair State University Institutional Review Board.

Are there any questions? If you have any questions later please email me at catalanoc@montclair.edu.

Thank you for your time. I hope you will be willing to complete the questionnaire.

APPENDIX S: RECRUITMENT E-MAIL: STUDENT

Dear Teacher Education Student:

I am writing to ask you to participate in a research study that will be happening over the next few weeks. In order to participate you must be a future P-3 or Elementary Education Teacher enrolled in a teacher certification program or a practicing P-3 or Elementary Education Teacher pursing a master's degree. You can be teaching in a general or self-contained setting.

To participate in this study simply follow the link below and complete four documents:

1. A consent form.
2. A background survey, that asks about your demographics, educational experiences, and experiences in working with children with autism.
3. A 12-item scale that asks about your general teaching beliefs, and
4. A 32-item scale that asks about your beliefs about teaching children with Autism.

It should take you about 15-20 minutes to complete all four documents. Your responses are completely anonymous and all findings will be reported as a summary.

By completing the survey and scales you will be contributing to the field of teacher education and development. The goal of this study is to create a scale that can be used by teacher educators and education researchers. This research scale would help them

better understand how to prepare and support teachers working with students with autism spectrum disorder in general education classrooms.

This study has been approved by the Montclair State University Institutional Review Board. If you have any questions please contact me, Corinne Catalano, at catalanoc@montclair.edu.

Link to documents:

https://msusurveys.montclair.edu/msusurvey/index.php/632199/lang-en

Thank you,

Corinne G. Catalano, Ph.D. Candidate

Assistant Director for Consultation Services

Center for Autism and Early Childhood Mental Health

College of Education and Human Services

Montclair State University

catalanoc@montclair.edu

APPENDIX T: RECRUITMENT EMAIL-PERSONAL & PROFESSIONAL CONTACTS

Dear Colleague:

I would like to request your participation in a research project that will be happening over the next few weeks. I am developing and validating an instrument, the Teacher Self-efficacy for Teaching Students with ASD in Inclusive Classrooms (TSE-ASDI) Scale, to measure teacher candidates and practicing early childhood teachers' beliefs in their ability to teach students diagnosed with autism spectrum disorder (ASD) in inclusive classrooms. In order to participate you must be a practicing P-3 teacher or enrolled in a P-3 teacher certification program.

To participate in this study simply follow the link below and complete four documents:

1. A consent form.
2. A background survey, that asks about your demographics, educational experiences, and experiences in working with children with autism.
3. A 12-item scale that asks about your general teaching beliefs, and
4. A 32-item scale that asks about your beliefs about teaching children with Autism.

It should take you about 15-20 minutes to complete all four documents. Your responses are completely anonymous and all findings will be reported as a summary.

By completing the survey and scales you will be contributing to the field of teacher education and development. The goal of this study is to create a scale that can be used by teacher educators and education researchers. This research scale would help them better understand how to prepare and support teachers working with students with ASD in general education classrooms.

After completing the survey and scales you will be directed to a new survey form where you can enter your email address to be included in a drawing to win one of four fifty dollar Amazon gift cards. These emails will be used solely for the purposes of the drawing, and to send the winners the gift cards electronically. Upon completion of the drawing, the information in this separate survey will be deleted.

This study has been approved by the Montclair State University Institutional Review Board. If you have any questions please contact me, Corinne Catalano, at catalanoc@montclair.edu.

Link to documents:

https://msusurveys.montclair.edu/msusurvey/index.php/183859/lang-en

Thank you,

Corinne G. Catalano, Ph.D. Candidate

Assistant Director for Consultation Services

Center for Autism and Early Childhood Mental Health

College of Education and Human Services

Montclair State University

catalanoc@montclair.edu

APPENDIX U: RECRUITMENT E-MAIL: TEACHERS

Dear Early Childhood Teacher:

I would like to request your participation in a research project that will be happening over the next few weeks. I am developing and validating an instrument, the Teacher Self-efficacy for Teaching Students with ASD in Inclusive Classrooms (TSE-ASDI) Scale, to measure teacher candidates and practicing early childhood teachers' beliefs in their ability to teach students diagnosed with autism spectrum disorder (ASD) in inclusive classrooms. In order to participate you must be a practicing P-3 Teacher.

To participate in this study simply follow the link below and complete four documents:

1. A consent form.
2. A background survey, that asks about your demographics, educational experiences, and experiences in working with children with autism.
3. A 12-item scale that asks about your general teaching beliefs, and
4. A 32-item scale that asks about your beliefs about teaching children with Autism.

It should take you about 15-20 minutes to complete all four documents. Your responses are completely anonymous and all findings will be reported as a summary.

By completing the survey and scales you will be contributing to the field of teacher education and development. The goal of this study is to create a scale that can be used by teacher educators and education researchers. This research scale would help them better understand how to prepare and support teachers working with students with ASD in general education classrooms.

After completing the survey and scales you will be directed to a new survey form where you can enter your email address to be included in a drawing to win one of four fifty dollar Amazon gift cards. These emails will be used solely for the purposes of the drawing, and to send the winners the gift cards electronically. Upon completion of the drawing, the information in this separate survey will be deleted.

This study has been approved by the Montclair State University Institutional Review Board. If you have any questions please contact me, Corinne Catalano, at catalanoc@montclair.edu.

Link to documents:

https://msusurveys.montclair.edu/msusurvey/index.php/183859/lang-en

Thank you,

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APPENDIX V: RECRUITMENT: SOCIAL MEDIA POST

Friends – I am conducting a research study on teachers' beliefs about their ability to teach students diagnosed with autism spectrum disorder in inclusive early childhood classrooms. If you are a teacher in pre-school through third grade or you are preparing to become an early childhood teacher, please follow this link

https://msusurveys.montclair.edu/msusurvey/index.php/183859/lang-en

to complete four brief documents (it should take 15-20 minutes). Your responses are completely anonymous and all findings will be reported in summary. This study has been approved by the Montclair State University Institutional Review Board. If you have any questions please contact me, Corinne Catalano, at catalanoc@montclair.edu.

Please share this post with any early childhood teachers or teacher candidates you know.

Thanks so much!

APPENDIX W: RECRUITMENT: SOCIAL MEDIA-FACEBOOK

Hello! I am conducting a research study on teachers' beliefs about their ability to teach students diagnosed with autism spectrum disorder in inclusive early childhood classrooms. If you are a teacher in pre-school through third grade or you are preparing to become an early childhood teacher, please follow this link

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Please share this post with any early childhood teachers or teacher candidates you know.

Thanks so much!